THE INDUSTRY'S RECOGNIZED AUTHORITY

ROCK PRODUCTS

LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD

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Testing Mineral Wool Raw Materials page 70

Stone Plant Helps Build Big Dams page 74

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Dredge and slackline cableway excavator, Dakota Sand and Gravel Co., Bismarck

NOVEMBER 1954

LOWER YOUR COST-PER-TON FOR CRUSHED STONE!

WILLIAMS *Heavy Duty* HAMMER MILLS

With a Williams, you don't need a primary crusher and another two or more secondary grinders — because *a single Williams Hammer Mill does the complete job in one operation!*

That means no additional machines are necessary — no extra foundations, housing, conveyors, drives or other equipment — *a saving up to 75% on initial investment!* And because a Williams does the job faster and better, you can *cut your crushing costs up to 50%!*

There's a Williams to suit *your* specific need, no matter what it is! It will pay you to *get the facts now!*

TYPICAL WILLIAMS HAMMER MILLS AND WHAT THEY CAN DO

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SLUGGER	Reduces 100-pound stone to 1½", ¾" or agstone — in one operation! Capacities up to 100 tons per hour.
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—for fine grinding to 400 mesh or micron sizes

AIR SEPARATORS
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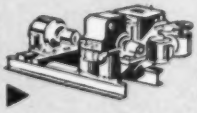
VIBRATING SCREENS
— in any size for any job. 1 to 3 decks, open or enclosed.

HELIX-SEAL MILLS
— for dust-free grinding, and for wet, sticky, greasy materials.



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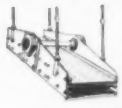

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ROCK PRODUCTS

THE INDUSTRY'S RECOGNIZED AUTHORITY — LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD

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Rubber belt drains off water to speed ore washing

RIDING up that conveyor belt is crushed iron ore, still sopping wet from the washing that removes sand or silica.

As you can see, this is no ordinary belt. If it were, water seeping down through the ore would form a pool at the bottom of the belt trough, and wash the ore down the 20° incline. That's why the Riffle Grip belt you see here was recommended by B. F. Goodrich.

You'll notice that the Riffle Grip belt has a series of rubber ridges molded into the cover. It's this tread with angular steps that holds the ore in place, and, at the same time, channels water to the edges of the belt where it flows off. B. F. Goodrich engineers developed this belt to solve a gold dredging problem. And it is such an improvement over ordinary belts that it's now widely used in mining operations, sand and gravel plants, and other places where wet materials must be carried up steep inclines.

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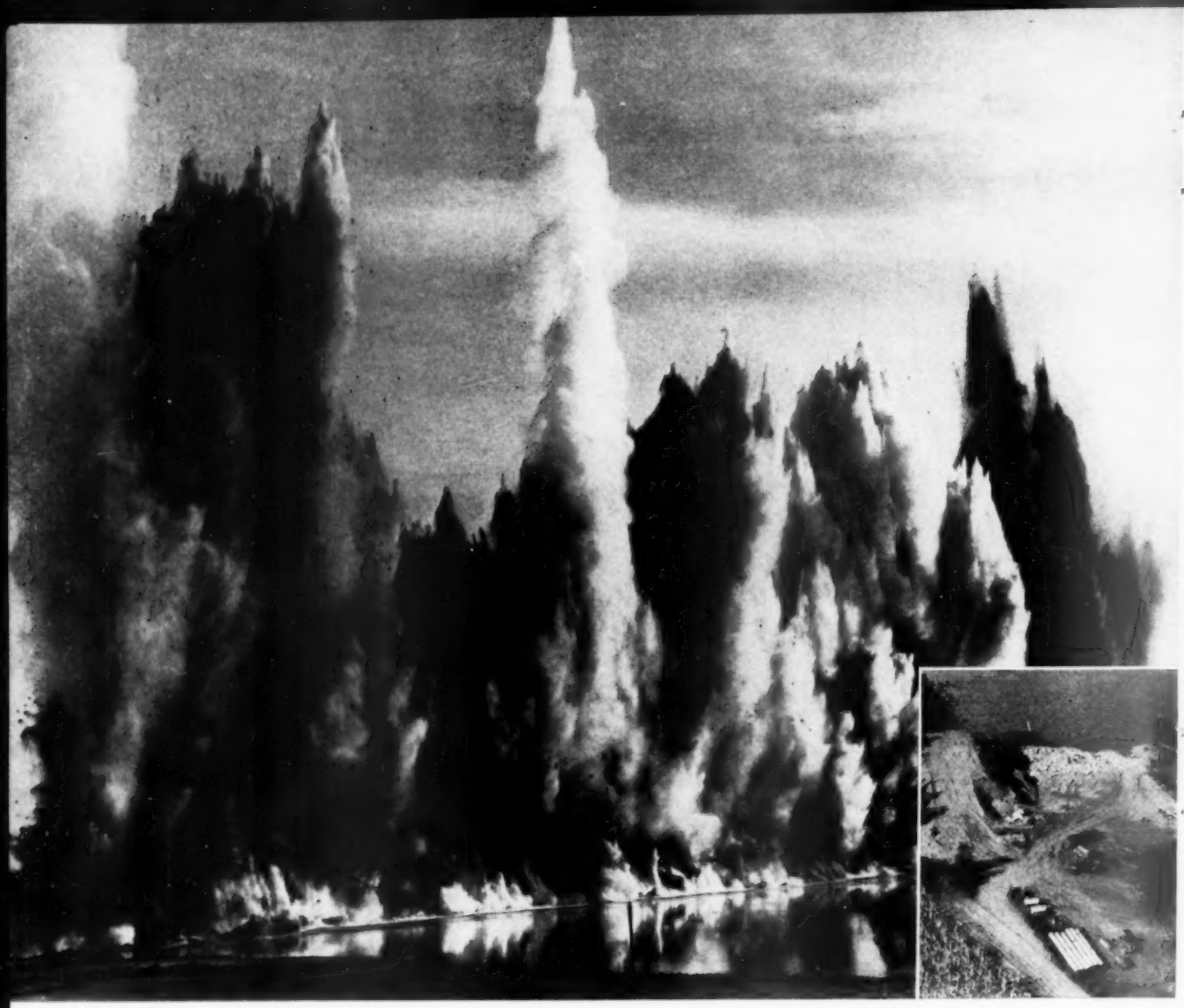
INDUSTRIAL PRODUCTS DIVISION



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explosives research pays off

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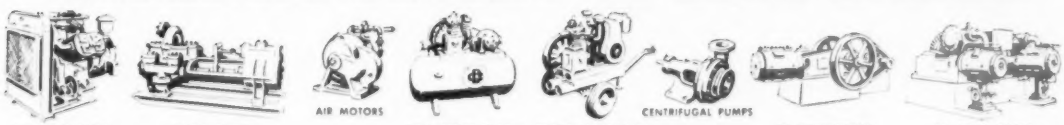

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806 OWNERS OF TRAYLOR TY REDUCTION CRUSHERS SAY

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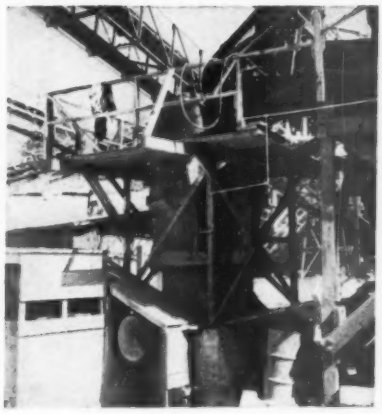

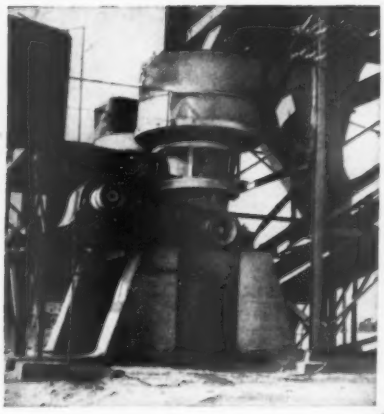

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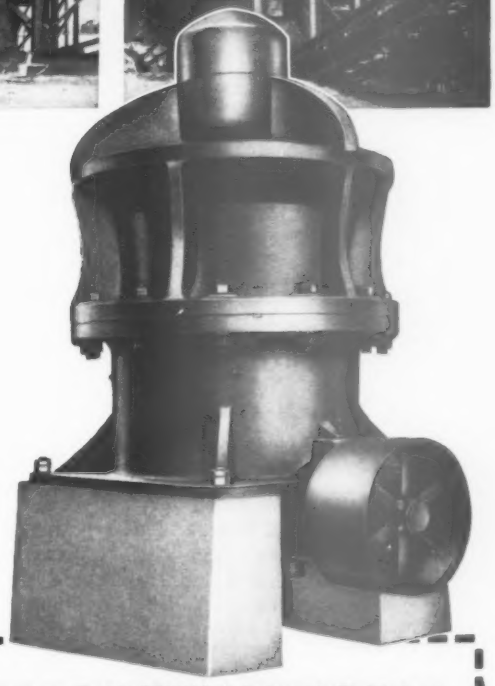
Type TY Traylor Reduction Crushers are of compact design . . . incorporating maximum strength with simplified operation. Six sizes with feed openings from 3" to 22". Send for free bulletin 7112.



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TY REDUCTION CRUSHERS

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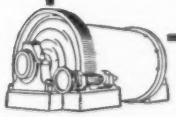

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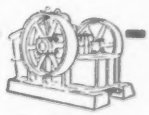

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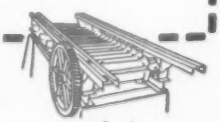

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CHEVROLET

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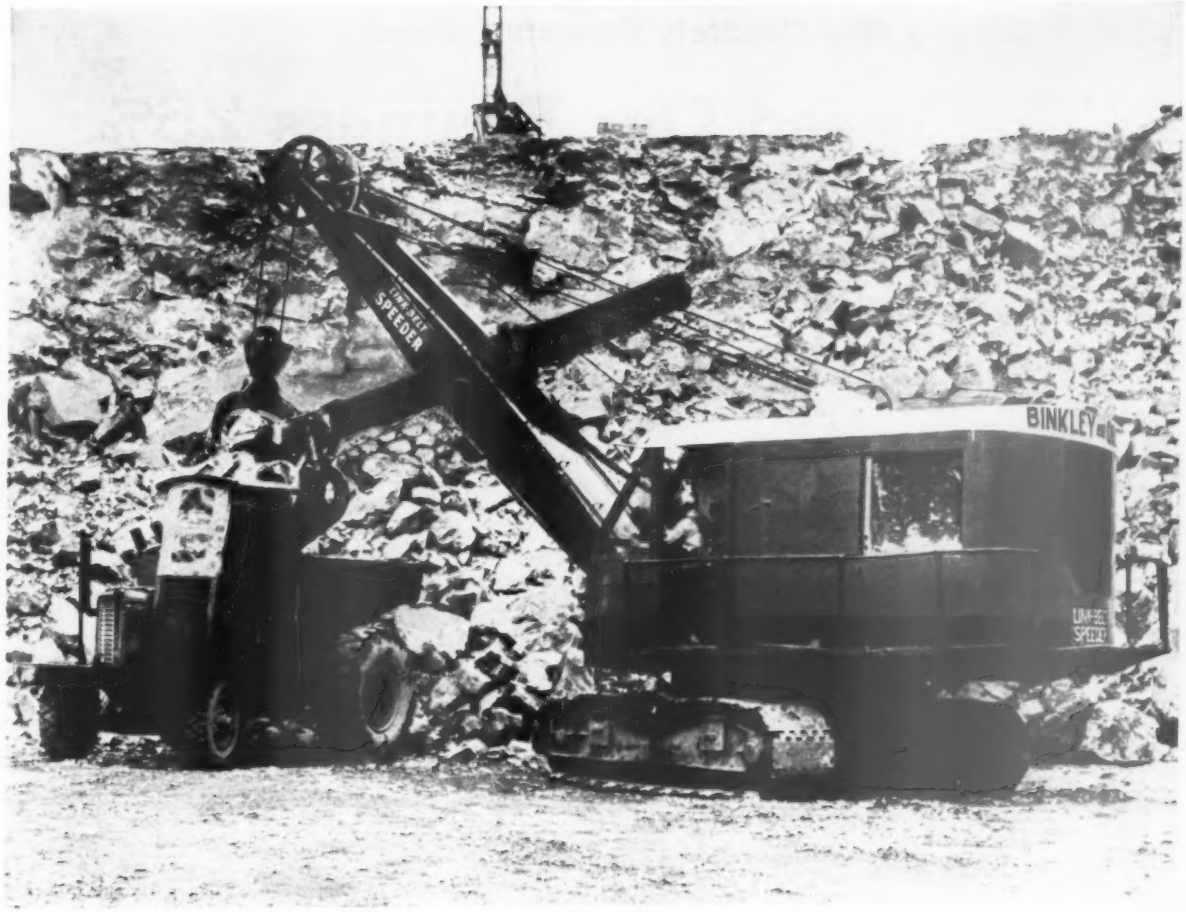

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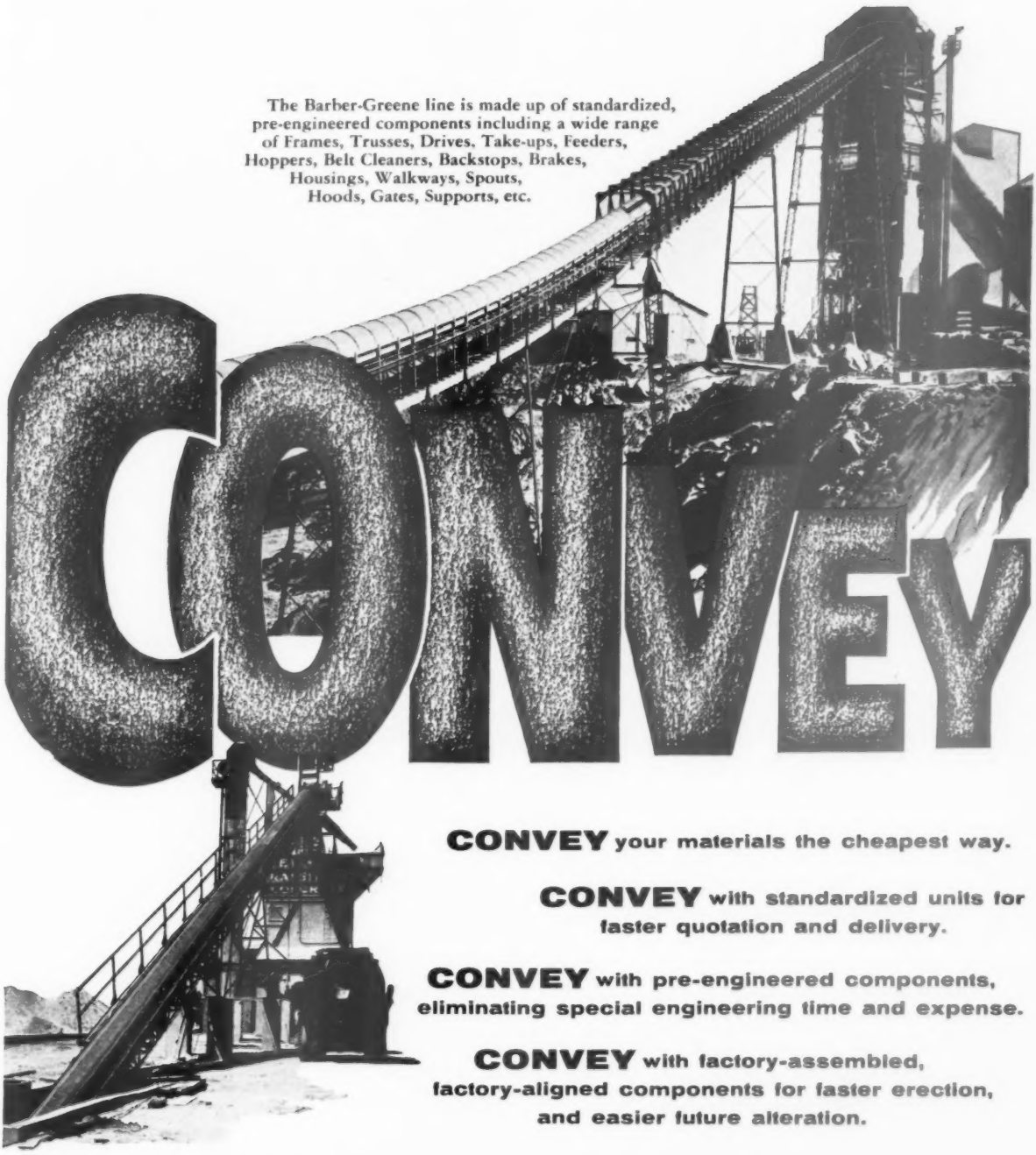

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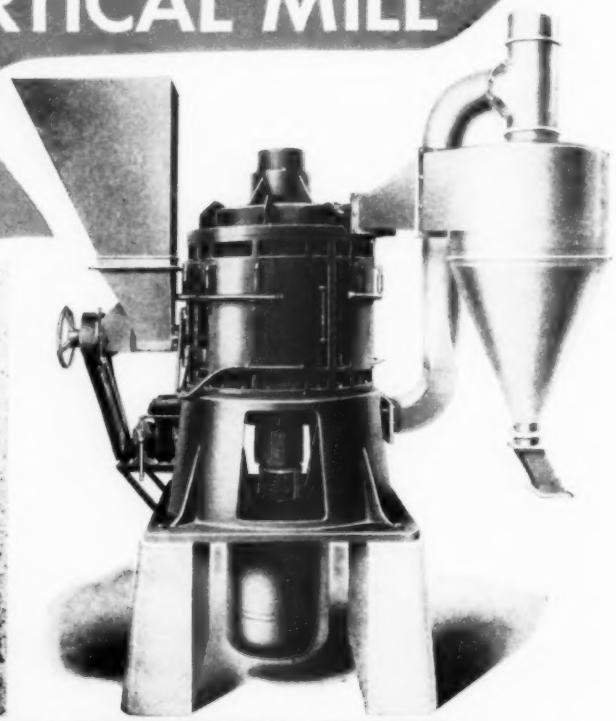
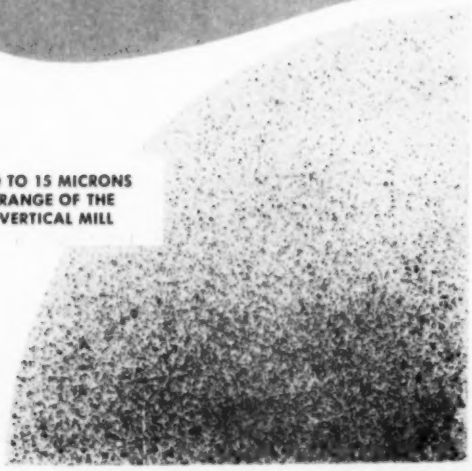
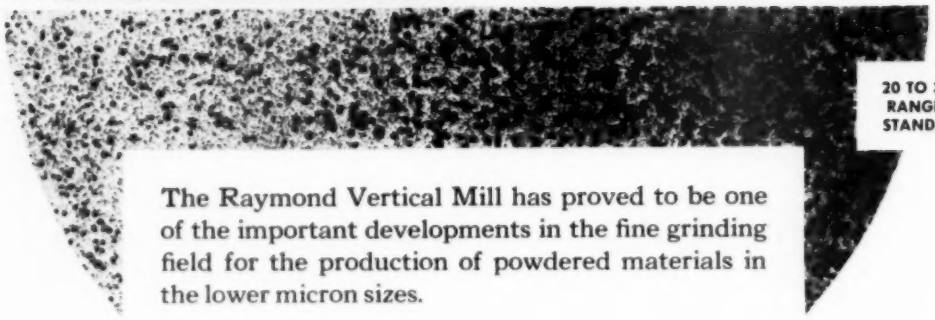
for ECONOMICAL PRODUCTION *of* EXTREME HIGH FINENESS MATERIALS





10 TO 15 MICRONS RANGE OF THE VERTICAL MILL



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The Raymond Vertical Mill has proved to be one of the important developments in the fine grinding field for the production of powdered materials in the lower micron sizes.

It operates in a fineness range beyond that of ordinary pulverizers. Many products can be reduced with this mill to 95% to 99% finer than 15 to 20 microns. Other softer materials of smaller crystalline structure can be ground to finenesses as high as 95% to 99% finer than 5 to 10 microns.

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Write for New Bulletin No. 70 for detailed information on the Vertical Mill

COMBUSTION ENGINEERING, INC.

Raymond Division

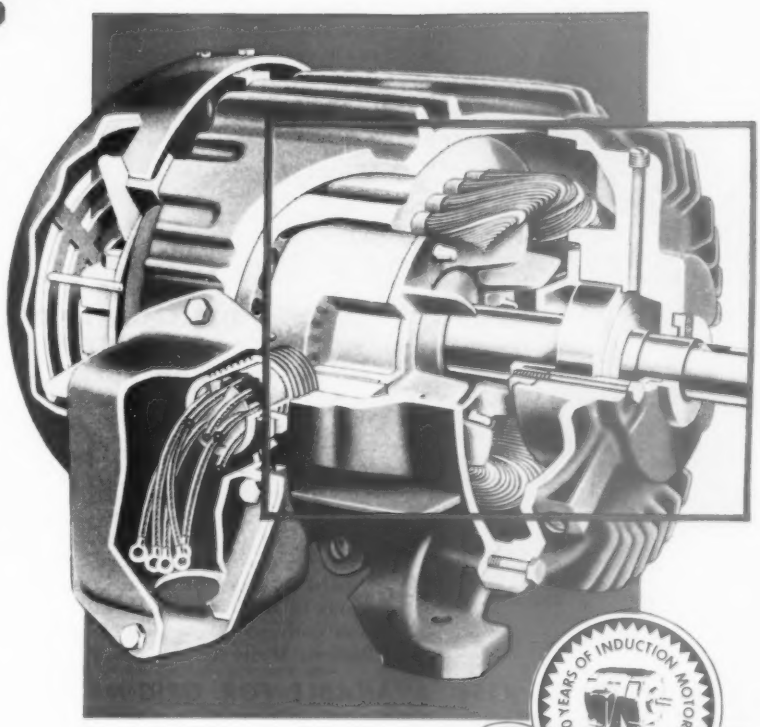
1307 NORTH BRANCH ST., CHICAGO 22, ILLINOIS

SALES OFFICES IN PRINCIPAL CITIES

It takes Six Bolts –

not just four

to give full bearing protection for greater motor performance



THE TWO EXTRA BOLTS in the end housing of every Allis-Chalmers ball bearing motor are the proof of *extra* protection against bearing failure. These are the bolts that hold the bearing cap tightly in place against the inner face of the bearing enclosure. This cap, with its close running clearances, keeps grease from the interior of the motor . . . retains an ample supply within the bearing enclosure . . . protects the grease and the bearing against contamination from dirt and moisture.

At the outer side of the bearing, double labyrinth seals keep grease in, also keep dirt out. What's more, large grease reservoirs act as additional dirt traps.

Result? Allis-Chalmers motors pay off in longer, trouble-free bearing life, lower motor maintenance.

50 YEARS OF INDUCTION MOTORS
ALLIS-CHALMERS · NORWOOD WKS.

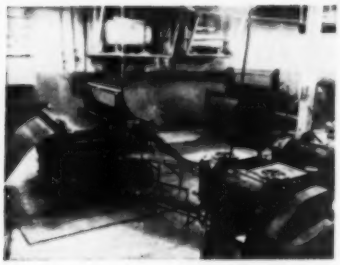
Get all the facts . . . judge for yourself — Compare Allis-Chalmers motors with other motors. Get the six-bolt construction that gives you complete bearing protection. For proof, see your Allis-Chalmers Office or Authorized Distributor, or write — Allis-Chalmers, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

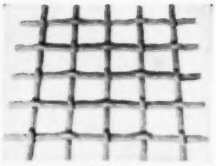
A-C
ALLIS-CHALMERS

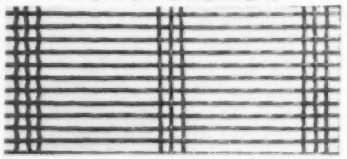
A-4444

THREE GOOD WAYS TO CUT YOUR MAINTENANCE COSTS



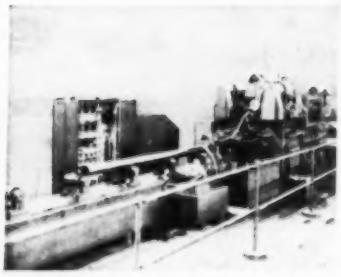
USE IOWEAVE SCREEN CLOTH





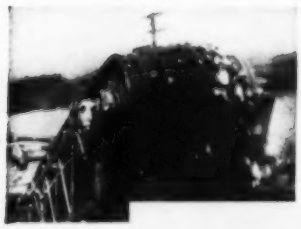
Ioweave is made by Cedarapids from a special analysis, oil tempered wire that will withstand fatigue and wear against abrasion. This high quality wire makes it possible to use a lighter gauge for a given size of opening, thus greatly increasing the tonnage output.

Ioweave is available in a wide range of sizes and weaves to fit your needs. Write for Bulletin CS-4.



USE CEDARAPIDS CONVEYOR EQUIPMENT

The automatic machine shown here turns out a complete conveyor idler every 28 seconds with permanently sealed, oil lubricated, heavy duty, single row, self-aligning ball bearings which eliminate the need for field lubrication. Heavy gauge steel tubing rolls insure perfect and constant balance. Cedarapids conveyor troughing roll assemblies and return idlers are available in widths from 14″ to 48″. Write for Bulletin CON-1.



USE CEDARAPIDS MOTORIZED HEAD PULLEYS

You can cut your conveyor maintenance costs 70% to 90% by installing Cedarapids Motorized Head Pulleys. All the drive mechanism is contained inside the pulley shell so there are no chains, sprockets or sheaves out in the weather and dirt, no chain idlers to keep adjusted and oiled, no V-belts to adjust or replace, no shafts and drives to service and lubricate. Modernize your conveyors now with Motorized Head Pulleys. Write for Bulletin MP-1.

ALL ITEMS ALSO AVAILABLE FOR ORIGINAL EQUIPMENT MANUFACTURERS

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U.S.A.

The Cedarapids Line also includes: ***Portable and stationary crushing, screening and washing plants for stone, gravel and sand. Vibrator and revolving screens. Feeders. Hammermills. Double impeller impact breakers. Batch type and continuous mix type bituminous mixing plants. Driers. Dust Collectors. Vibrating soil compaction units.***

With the All-Motor Type

ALL-STEEL FALK Motoreducer

you can interchange motors in minutes... *on the job!*

Fast, easy maintenance gives savings in time and money

With the *all-steel,* All-Motor type FALK Motoreducer . . . the only complete and compact motorized reducer with a separately mounted, resilient Steelflex coupling-connected motor . . . you can replace or interchange motors, or *even parts,* in minutes—*on the job,* without long and costly "down time"! Ratios can be changed (within capacity) without motor modification.

Any make, speed, or type of standard foot-mounted motor within the unit's AGMA rating is usable *without modification* on this All-Motor type Motoreducer. Motors with variable speed drive arrangement can be used, if desired. No "partial" motor or special shaft is required in event of motor replacement—simply use a complete motor, available for quick delivery from factory or local stocks without expensive delays.

Add to these exclusive maintenance-saving advantages the FALK "In-built" Factors, described at the right, and you have an unbeatable combination of quality, application adaptability, dependability, long-range economy, and dollar-for-dollar value. Write for Bulletin 3104.

Every FALK Motoreducer has these "In-built" Factors—

Positive Lubrication. Large sump capacity . . . oil-tight construction assures clean lubricant . . . direct dip of revolving elements provides positive lubrication at all speeds.

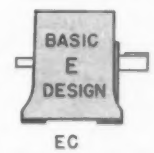
Wide Speed Range. Selective ratio combinations provide output speeds from 1.5 rpm to 1430 rpm with stock gears.

Streamlined Inside and Outside. Smooth, clean surfaces; machine welded construction conforms to NEMA motor frames.

Sealed Housings. Dual closures and one-way vents keep oil *in,* dust and moisture *out.* Units are splash-proof, leakproof, dustproof.

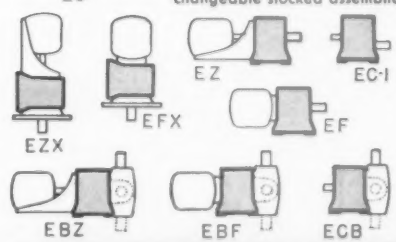
Precision Gearing. Heat treated alloy steel, precision cut and shaved helical gearing throughout . . . quiet-operating crown shaved pinions . . . taper bored gears for easy ratio changes.

All-steel Housings. Unbreakable, strong, rigid. Generous overhung load capacities provided by wide bearing spans, large shafts and bearings.



EC

The basic E design permits maximum use of standardized parts . . . closer control over materials, processing, inspection and assembly . . . resulting in faster delivery from interchangeable stocked assemblies.



FALK ...a good name in industry

THE FALK CORPORATION · 3001 W. Canal St. · Milwaukee 8, Wis.

WRITE FOR BULLETIN 3104

HERE'S A GOOD ONE:

"Handled 280,000 tons of stone and lime, in two yards—that's our MICHIGAN's *7-year record"*

...SAYS THIS DELIGHTED OWNER

JOB FACTS

Job: Unloading, reloading agricultural lime; loading crushed stone into trucks and hoppers

Machine: MICHIGAN T-K-6—25' boom and ⅜ yd. clamshell

Owner: Terminal Materials Co., St Joseph, Michigan—two yards, St. Joseph and Lawrence, Mich.

Tonnage: 280,000—total for nearly 7 years; working in both yards 25 miles apart

"We give this machine the 'full treatment,'" says Bela Lindenfeld, Terminal president; "work it up to 18 hours per day, 52 weeks a year. We've written it off, yet have had a mighty tempting offer for it. But it's doing too good a job for us. MICHIGAN Air Control, ease of operation, speed, mobility—those are the reasons."

Says Orville Richardson, operator: "I spend half an hour a day on oiling, greasing and check-up; and the boss says it has sure paid off."

Isn't that exactly the kind of service you want? Watch these big, rugged MICHIGANS in action, note their speed and smooth precision—and you'll see how you, too, can Move More with a MICHIGAN. Talk to your MICHIGAN dealer; and write for interesting, helpful booklet, "Get More Yardage Through Air Power."

***These are the pay-off reasons why you Move More with a* MICHIGAN**

- **MICHIGAN Air Control**—fast, smooth eliminates fatigue, increases yardage
- **Rugged Construction**—built to withstand extremes of hard service
- **Easy Maintenance**—no complicated mechanical linkage; greasing takes only a few minutes

CLARK EQUIPMENT Construction Machinery Division

CLARK EQUIPMENT COMPANY
452 Second St., Benton Harbor, Mich.

Any Way You Figure It - dragline yardage - days in service - total cost per yard

Tuffy®
DRAGLINE
cuts costs to minimum!

Draglines operate under conditions that impose a combination of abuses not encountered in other rope service. The structure of Tuffy Dragline adapts itself to this special job. Tuffy's outer layer of wires offers the largest possible area to resist abrasion. Tuffy's inside structure is such as to give plenty of flexibility in casting. As a whole, this combination of pre-shaped strands gives extra-ordinary strength to withstand digging shocks and heavy line pulls.

Whether you're handling wet or dry dirt, sand, gravel or rock, Tuffy Draglines offer a way to cut rope costs substantially – enabling you to bid a little closer against tightening competition.

No More Complicated Specifications to cause confusion in ordering! Just state length, diameter and "Tuffy Dragline!" See for yourself how Tuffy can move more material for *you* for a longer time!

Tuffy
Scraper Rope
Plenty flexible to withstand sharp bends . . . plenty stiff to resist kinking when slack . . . plenty tough to withstand drum crushing.

Tuffy
Hoist Line
Designed for hoist line use on all types of cranes, derricks and clamshells. Tough, flexible, passes safety checks longer.

Tuffy
Dozer Rope
A glutton for punishment on small winch drums and small sheaves. Available in 1/2" and 9/16" in 150' lengths.

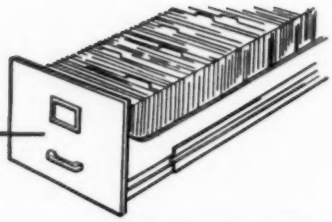
Tuffy
Slings
Extra flexible, extra strong because of a patented, 9-part, machine braided wire fabric construction.

union Wire Rope **corporation**

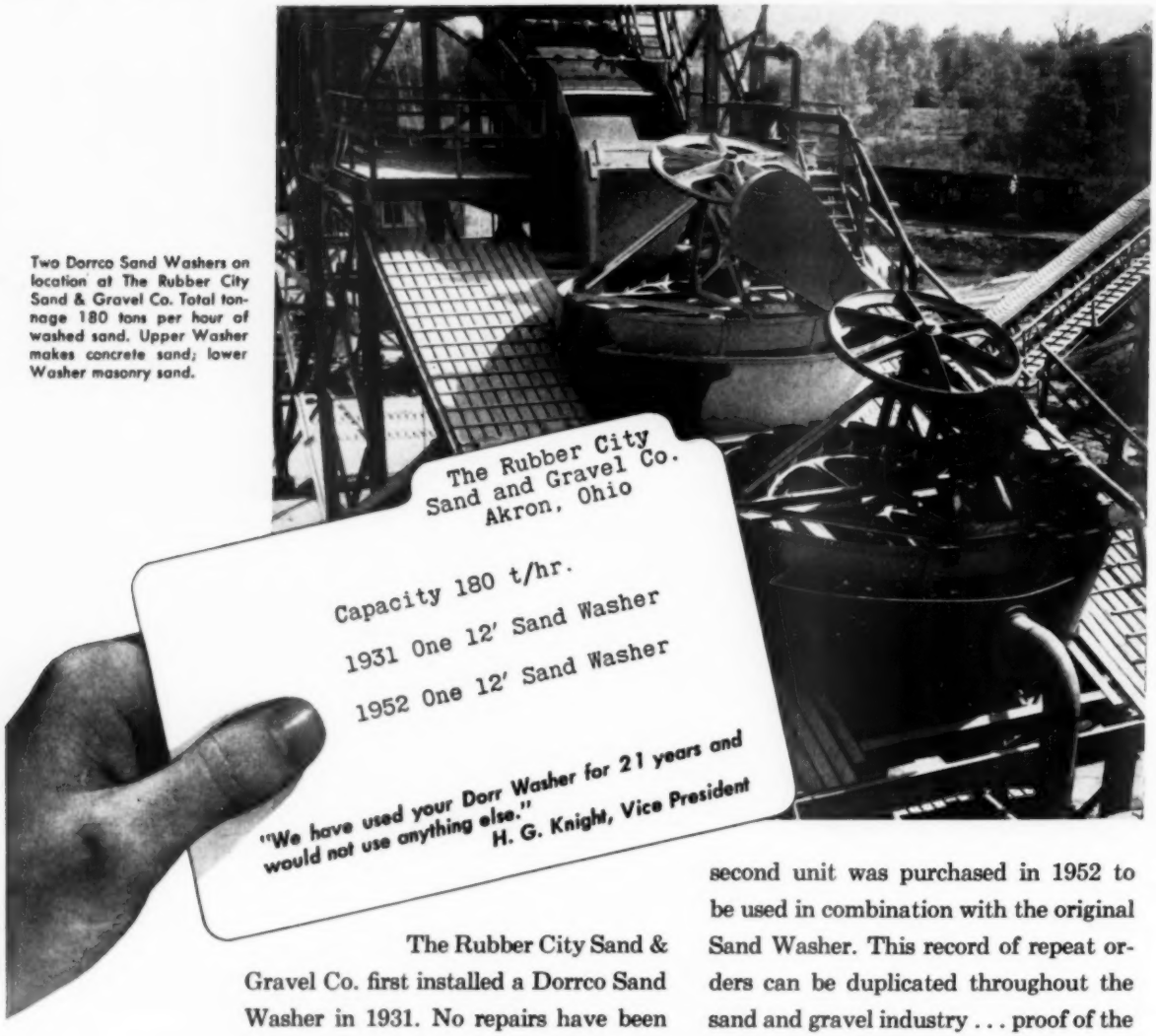
2156 Manchester Ave. • Kansas City 26, Mo.

Specialists in High Carbon Wire, Wire Rope and Braided Wire Fabric

From our repeat order file



Dorrco Sand Washers in OHIO


The Rubber City
Sand and Gravel Co.
Akron, Ohio
Capacity 180 t/hr.
1931 One 12′ Sand Washer
1952 One 12′ Sand Washer
"We have used your Dorr Washer for 21 years and would not use anything else."
H. G. Knight, Vice President

Two Dorrco Sand Washers on location at The Rubber City Sand & Gravel Co. Total tonnage 180 tons per hour of washed sand. Upper Washer makes concrete sand; lower Washer masonry sand.

The Rubber City Sand & Gravel Co. first installed a Dorrco Sand Washer in 1931. No repairs have been necessary on this unit to date. After all these years of satisfactory operation, a second unit was purchased in 1952 to be used in combination with the original Sand Washer. This record of repeat orders can be duplicated throughout the sand and gravel industry . . . proof of the reliable service and rugged construction of Dorrco Sand Washers.

Better tools TODAY to meet tomorrow's demand

DORR

WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

THE DORR COMPANY • ENGINEERS • STAMFORD, CONN.
Offices, Associated Companies or Representatives in principal cities of the world.

FIFTY YEARS 1904-1954

SMALL QUARRIES AND MINES IMPROVE THEIR PROFIT PICTURE WITH "EUCS"

fewer drivers . . . lower fuel cost . . . reduced maintenance

When your competitors are using "Eucs" to haul stone, sand or gravel, you've really got a problem on your hands! You just can't afford to pass up the cost cutting advantages . . . the high production and low maintenance cost . . . that you get with "Eucs".

And your operation doesn't have to be a big tonnage producer for "Eucs" to pay off. For example, H & R Stone Co. of Indiana is just one of many small quarries, sand and gravel producers, and open pit mines that have cut their hauling costs with Model UD 10-ton Rear Dumps. This quarry replaced four conventional highway trucks with a single 10-ton "Euc" and reports savings of $6000 per year in maintenance cost alone. Because the "Euc" stays on the job with none of the lost time that was a costly headache previously, there have been important savings in labor cost, too.

Have your nearby Euclid Distributor provide a production and cost estimate for your operation . . . there's no obligation and the chances are mighty good that he can show the way to better profits through lower hauling costs.

10-ton off-highway "Euc"

EUCLID DIVISION
GENERAL MOTORS CORPORATION
Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

GM GENERAL MOTORS

Relief... for a production pain

What's your particular "ache"? Looking for ways to cut costs...improve production...speed plant operations...reduce maintenance costs?

Here's a prescription that can provide an effective solution for you... the specialized service offered by your Chain Belt Field Sales Engineer and the outstanding performance of Chain Belt Equipment:

for example: If bucket elevator chain breakage is your "headache," Rex® S-858 and S-856 chains will provide relief. These precision-made steel chains will not break...properly applied, they may *wear* out after the longest possible service life. They will outlast...outwear any other chains built for bucket elevator service.

for example: If you're having trouble with your chain drives, Rex Chabelco® Steel Chains are your answer. These rugged chains are designed and built for the toughest service, especially where dust, dirt or heat is a problem. They stand up under heaviest loads...transmit more h.p. per dollar.

for example: If maintenance is your problem, here's a suggestion. Use Rex Split Hardened Rim Traction Wheels and Sprockets. Just install the body, then each rim segment. Replacement of rim section can be done without removing the chain. Down time can be reduced with these long-wearing traction wheels and sprockets.

Whatever your needs...drive chain, conveyor and elevator chain, complete elevators, belt conveyors, feeders, roller bearings, buckets or sprockets, you'll relieve those production pains by looking to Chain Belt. See your local Field Sales Engineer or write direct to Chain Belt Company, 4649 W. Greenfield Ave., Milwaukee 1, Wis.

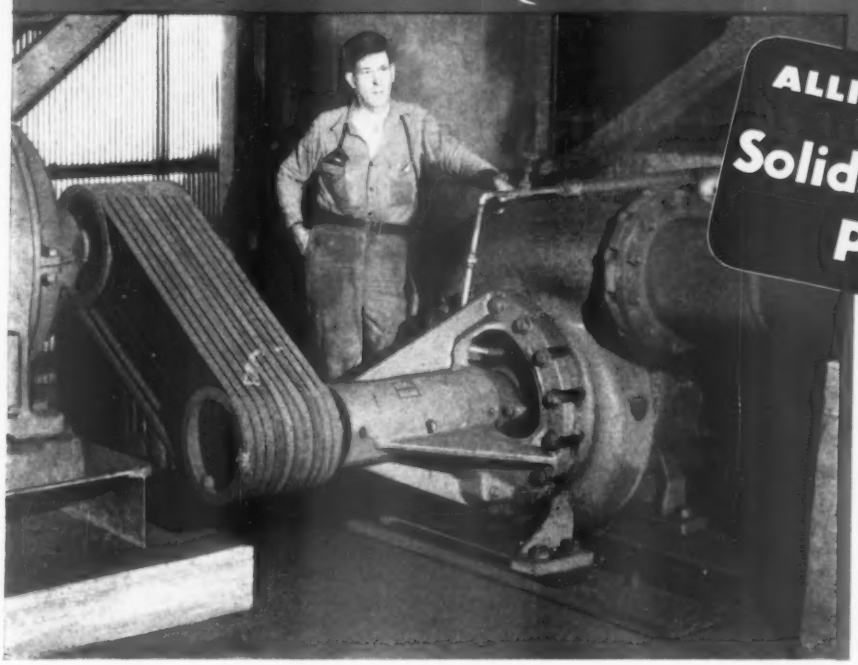
CHAIN BELT COMPANY

District Sales Offices and Distributors in all Principal Cities

Operators Report . . .

"INCREASED PUMPING LIFE 3 TIMES"

"SAVES US $300 PER MONTH IN MAINTENANCE"



ALLIS-CHALMERS
Solids Handling
PUMP

Long Life...Low Cost Operation

Proved by Service Records

In many operations, where other pumps had a life of two or three weeks before they required service, Allis-Chalmers solids handling pumps piled up an impressive record. Typical service records show: 8 months, no loss of capacity — 9 months, 2 and 3 shifts, new impeller — 10 months' service, no parts replaced. These are just a few examples.

Allis-Chalmers solids handling pumps have established this fine record because they are made of a special hard alloy . . . because extra wear is built into impeller and wear plate by the use of *Ni-Hard** . . . because they are built with extra strong parts and extra thickness of metal in critical parts . . . because they are application engineered by men who know solids handling equipment problems.

When replacement finally does become necessary, A-C solids handling pump is easy to tear down and reassemble. Wearing parts are separated into easy-to-handle units. Piping need not be disturbed.

A-4323

ONLY 5 WEARING PARTS

Shaft sleeve
Impeller
Casing
Two wear plates

ALL EASY TO HANDLE AND EASY TO REPLACE.

* 3 largest sizes special hard alloy throughout. 6 sizes all *Ni-Hard* available.

For complete information about Allis-Chalmers solids handling pumps, call your local A-C representative, or write Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for bulletin 0886381.

A-C ALLIS-CHALMERS

ALLIS-CHALMERS

Wheel Mounting adds
EXTRA CAPACITY
and
GREATER MOBILITY

To LIMA Types 34, 44, 54, 604 and 703

COMPARE!

No other machine gives you as much as LIMA!

1. All gears, smaller parts and shafts which are subject to extra wear, are flame or induction hardened for longer life.
2. Main machinery is placed well back of center of rotation, to eliminate excess counterweight.
3. Anti-friction bearings, used at all important bearing points, reduce destructive friction, fuel consumption and lubrication requirements.
4. Big capacity drums and sheaves, lengthen cable life by reducing the need for double wrapping and sharp bends in cable.
5. Propel and swing gears and power take-off, are enclosed in a sealed oil bath for dirt elimination and smoother, quieter operation.
6. Torque converter (optional), automatically adjusts speed to load requirements, minimizing shock loading, making performance smoother and faster.
7. Wherever you are, you can depend on skilled service and nearby warehouse stocks of parts, to keep your LIMA on the job continuously.

Illustrated above is the LIMA Type 604 mounted on wheels to provide the advantages of better mobility and extra capacity where ground conditions permit its application. Five sizes are now available with wheel mounting—the Types 34, 44, 54, 604 and 703. Wheel mounted Type 34 has a crane capacity of 20-tons. Wheel mounted Type 44 has a crane capacity of 25-tons. Wheel mounted Type 54 has a crane capacity of 30-tons. Wheel mounted Type 604 has a crane capacity of 35-tons. Wheel mounted Type 703 has a crane capacity of 45-tons. (Capacities rated with outriggers supported.) In these units one engine powers all operations, including travel, and one operator controls them all from his cab. LIMA wheel mounted machines are ideal for many material handling operations requiring constant movement around the job. They will save travel time and reduce cost of moving machine between scattered job sites—often justifying the use of equipment on even the smallest operation.

TRUCK MOUNTED MACHINES ALSO AVAILABLE

You can now also get the LIMA Type 34, 44, 54, 604 and 703 in a truck mounted unit, with separate engine for traveling between jobs at speeds up to 31 MPH. Crawler-mounted LIMA machines are available in Shovel capacities from ¾ to 6 yds., Cranes to 110 tons and Draglines variable.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA

SHOVELS • CRANES
DRAGLINES • PULLSHOVELS

BALDWIN BLH LIMA-HAMILTON
Construction Equipment Division

BALDWIN-LIMA-HAMILTON CORPORATION
Construction Equipment Division
LIMA, OHIO, U.S.A.

today—it's a bigger catch with MUSCLES OF STEEL

Five billion pounds of fish yearly. It's a catch that would make the oldtime Gloucester fisherman gasp—yet it's all in the day's work for America's modern fishing industry. And it's a job that couldn't be handled without the aid of *muscles of steel*—indispensable wire rope.

Whether off the Newfoundland Banks, along the Gulf Coast, or in the waters of the Pacific, powerful winch-equipped trawlers depend on Wickwire Rope to haul in their heavily laden nets.

On landlubber assignments, too, Wickwire Rope has a vital role in helping American industry do a better and more efficient job. In the oil fields and the logging camps. In the mines and the quarries. On construction and highway projects. In numerous and varied materials handling operations. On all of these jobs, Wickwire Rope consistently demonstrates its ability to deliver performance that is unrivalled for long-lasting economy and reliability.

***every* industry benefits from wire rope**

WICKWIRE ROPE

CF&I PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

2534

THE COLORADO FUEL AND IRON CORPORATION—[illegible] (Tex.) • Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa
PACIFIC COAST DIVISION—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane
[illegible]

● Converting the raw building products provided by Nature into the rugged and beautiful works of man requires both vision and skill. It also requires *fuel*—the unseen factor behind every towering structure. Selecting the *right* fuel is important.

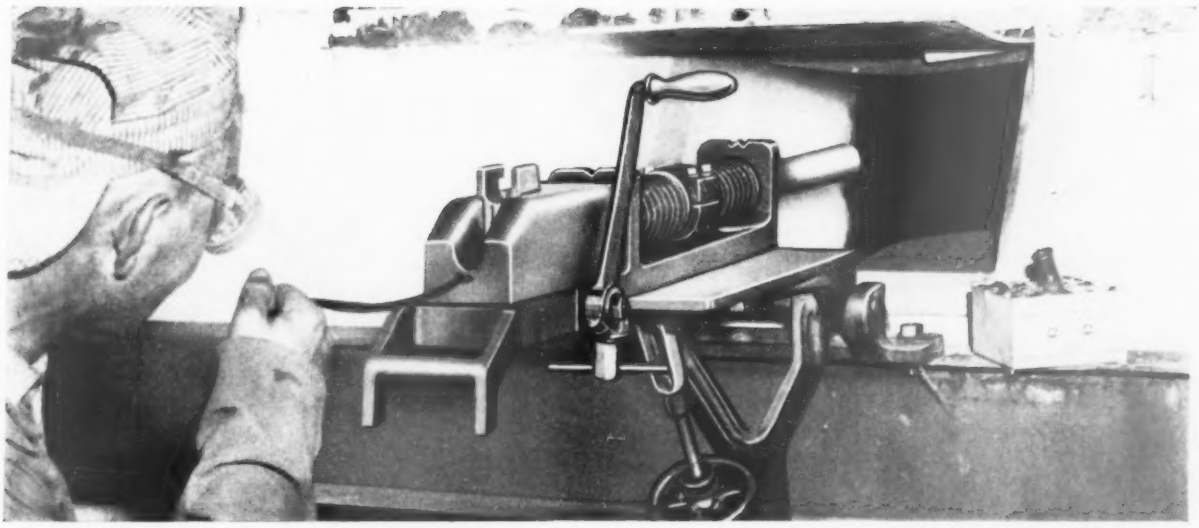
Along the Baltimore & Ohio are vast deposits of bituminous coal with structure and volatility ideal for producing cement, lime, and brick. Modern mechanization and the easy accessibility of the mines keeps production and transportation costs low. And because coal can be stored anywhere, the need for expensive facilities is eliminated.

We will be glad to advise you on the right kind of coal for your specific need, show you where to find it, and how to burn it. The modern efficiency, economy, and cleanliness of Bituminous will amaze you. *Ask our man!*

BITUMINOUS COALS FOR EVERY PURPOSE

BALTIMORE & OHIO RAILROAD

Constantly *doing things* **—better!**



Time cut 112 to 1 in removing kiln rings with the REMINGTON INDUSTRIAL GUN

VARIOUS MOUNTINGS ARE POSSIBLE with the Industrial Gun. Here's one of the most common: secure a 6" or 8" "I" beam across the face of the kiln and simply hook the mount into the bolster. The gun can also be mounted on a truck, a tripod, or a mobile chassis for shooting down obstructions in mines or quarries.

26 hours per month production time gained by refractory plant

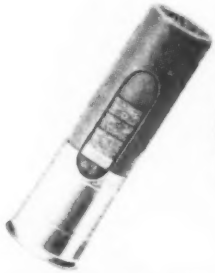
"We save 222 man-hours per month—and gain 26 hours' production time!" That's how the superintendent of a large refractory plant in Georgia sums up the reasons he's sold on the Remington Industrial Gun. Formerly, removal of kiln rings took 8 men an average of 28 hours per month. Two men now do the same job *in one hour*.

Hundreds of plants have found the industrial gun to be the fastest, most efficient method for ring removal. In seconds, one man can aim, load and fire the gun. A few shots loosen the ring . . . cause it to crumble when the kiln is rotated. There's never any need to cool and reheat the kiln. *Downtime is cut to a minimum!*

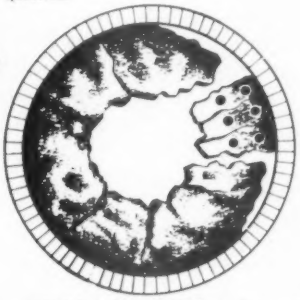
Use of the Remington Industrial Gun can mean big savings in labor, big gains in production for you. Our technicians will be glad to work with you on ring-removal problems at your plant. Just send the coupon for a free illustrated folder with complete information.

"If It's Remington—It's Right!"

Remington DUPONT



REMINGTON INDUSTRIAL SHELLS have tremendous smashing power. They're loaded with a powerful 3-ounce lead projectile that develops 7,475 foot-pounds' muzzle energy.



CUTTING A "KEY-WAY." A few well-placed shots loosen a section of clinker. The ring is weakened by this loss of the arch key . . . will usually fall without additional shots when the kiln is rotated.

Industrial Sales Division R.P.-11
Remington Arms Company, Inc.
939 Barnum Ave., Bridgeport 2, Conn.

Please send me your free folder describing the Remington Industrial Gun.

Name _____ *Position* _____

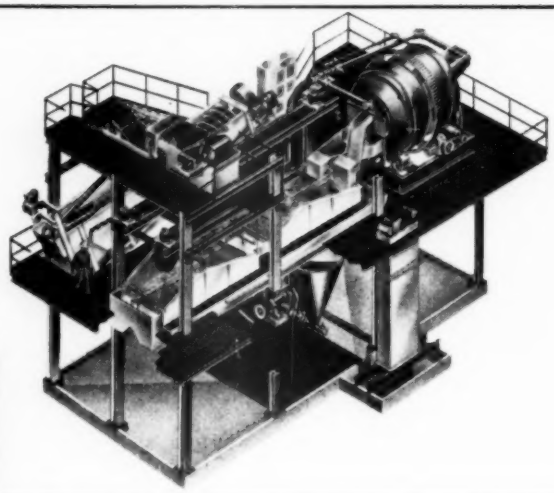
Firm _____

Address _____

City _____ *State* _____

GRAVEL PRODUCERS MEET RIGID SPECIFICATIONS WITH WEMCO MOBIL-MILLS

WEMCO HMS (Heavy Media Separation) Mobil-Mills are the economical answer to production of high specification aggregates when mechanical scrubbing methods fail. Using the modern HMS process, Mobil-Mills offer a proved, low cost, thoroughly practical means for upgrading local gravels to meet increasingly rigid aggregate specifications.



PRECISE CONTROL WITH HMS...

HMS is a simple sink-float process utilizing differences in specific gravity to float off light, unsound material, leaving hard, sound, premium aggregate. The sink-float principle gives economical and precise control of aggregate quality within limits established by the varying specific gravities of basic constituents.

MOBIL-MILLS CHALLENGE COMPETITIVE PROCESSES...

Increased demand for high specification aggregates cause **good** commercial deposits to lose value when ordinary upgrading methods fail to meet specifications. HMS processing with WEMCO Mobil-Mills succeeds when other methods fail — the difference between profit and loss.

IDEAL FOR ON-SITE PROCESSING...

WEMCO's pre-fabricated Mobil-Mills make on-site processing of many otherwise valueless gravel deposits commercially feasible. Quickly erected and dismantled, Mobil-Mills enable producers to treat widely scattered deposits at a first cost much less than that of permanent plants.

When large-scale construction projects are undertaken, on-site processing of local gravels is of prime importance. WEMCO Mobil-Mills have been the **only** answer when such deposits cannot be up-graded to specification by ordinary methods or when first cost of plant construction is a significant factor.

WEMCO MOBIL-MILLS GIVE YOU THESE IMPORTANT ADVANTAGES:

- **Capacity range** from 5 to 420 TPH
- **Choice of single drum,** two-compartment drum or cone separator to suit your exact needs
- **Pre-fabricated,** ready to install
- **Quickly erected;** low installation and operating costs
- **Clean separation** for high specification aggregates

GET THE FACTS NOW

It's a fact that over 50% of the world's HMS plants are Mobil-Mill equipped. Find out for yourself how a WEMCO Mobil-Mill can cut costs, strengthen your competitive position and extend the life of gravel deposits. **All** the facts about WEMCO Mobil-Mills are yours without obligation — just call or write to the nearest WEMCO office.

WEMCO®
WESTERN MACHINERY COMPANY
760-766 FOLSOM STREET · SAN FRANCISCO 7, CALIFORNIA

Mobil-Mills • Coal Spirals • HMS Thickeners • HMS Pumps • Sand Pumps Agitators • Cone Separators • Drum Separators • Hydroseparators • Densifiers Fagergren & Steffensen Flotation Machines • Dewatering Spirals • Thickeners S-H Classifiers • HMS Laboratory Units • Attrition Machines • Conditioners Fagergren Laboratory Units

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New simplicity and sustained efficiency in dust filtering and collection...

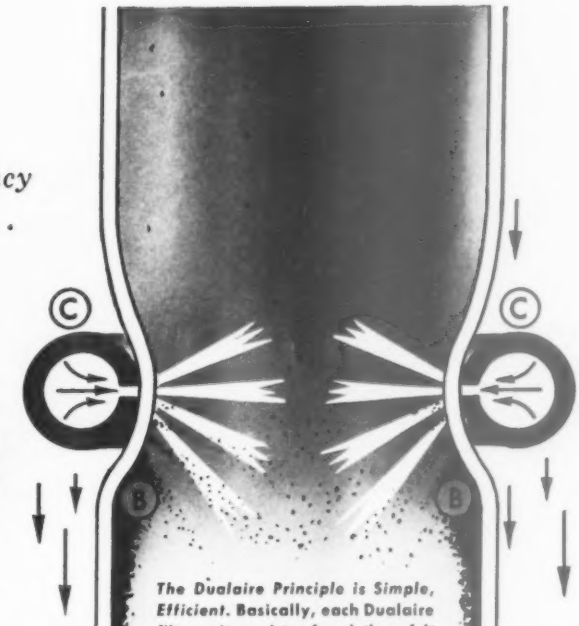
Dualaire*

REVERSE-JET DUST COLLECTOR

Efficiencies up to 99.99%

Cloth filter systems of one design or another have long been used by industry for cleaning industrial gases and/or recovering dust or other suspensions. But three problems are common to such systems... (1) Extreme changes in pressure drop and filtering efficiency as dust cakes accumulate on the filter surface... (2) Wide pressure fluctuations and surges in the plant system as filter units become clogged or are cut out and rapped for cleaning... and (3) Rapid deterioration of the filter material by the vibration, shaking and rapping equipment used for cleaning.

But now the DUALAIRE Collector—as engineered by Western Precipitation, pioneers in the field of dust recovery—provides the answer to these and other problems common to conventional bag-house equipment.



The Dualaire Principle is Simple, Efficient. Basically, each Dualaire filter unit consists of a cloth or felt tube, open at both the top and bottom. (A) Dust-laden gases enter at top of the tube and are filtered as they pass through the side walls of the tube to the exhaust system. (B) Dust particles collect on the inside of the tube and before the cake builds up sufficiently to affect filter operation, a tubular blow ring (C) automatically starts moving up and down the outside of the filter cylinder. A jet of air, concentrated by this blow ring, reverses the normal gas flow at the point contacted by the ring, thus jetting the dust layer off of the inner surface of the filter tube.

This jetting action is further assisted by a flexing of the filter cylinder as the blow ring passes, thus cracking and loosening the dust layer from the inner surface, from where it drops to the recovery chamber below the bottom of the tube.

The entire operation is positive and simple. The blow ring starts its action *automatically* as soon as the dust layer causes a pre-determined pressure differential. And after the filter surface is cleaned, the blow ring *automatically* stops.

6 ADVANTAGES OF DUALAIRE DESIGN...

PRESSURE DROP remains uniformly low at all times because the dust is removed continuously in *small portions.*

FILTERING EFFICIENCY remains uniformly high at all times without the "choking" action characteristic of conventional bag-houses. Actual field tests show efficiencies as high as 99.99%!

DUST RECOVERY is in steady increments—not in sudden large "batches" as with conventional rapping systems. Thus the Dualaire eliminates surges and detrimental variations in the plant system.

FILTER ELEMENT has a much longer life because it is not subjected to the stresses of rapping or jarring while being cleaned. Dualaire reverse-jet cleaning action is gentle, yet far more effective.

GREAT SAVINGS are also made in space and the size of installation required. Because each Dualaire filter unit is cleaned more-or-less constantly without shut-down, there is no need for costly standby units—or the complicated switching equipment to cut standby equipment in and out.

BASIC UNITS are "sectionalized" and are available in 5 standard heights. Sections can be bolted together in any desired multiple, providing a capacity range to fit virtually any requirement. As needs increase, add more sections.

There are many other advantages built into the DUALAIRE. *For further details send for this descriptive 12 page booklet. Or contact your nearest Western Precipitation representative!*

WESTERN Precipitation CORPORATION

DESIGNERS AND MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Offices 1006 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA
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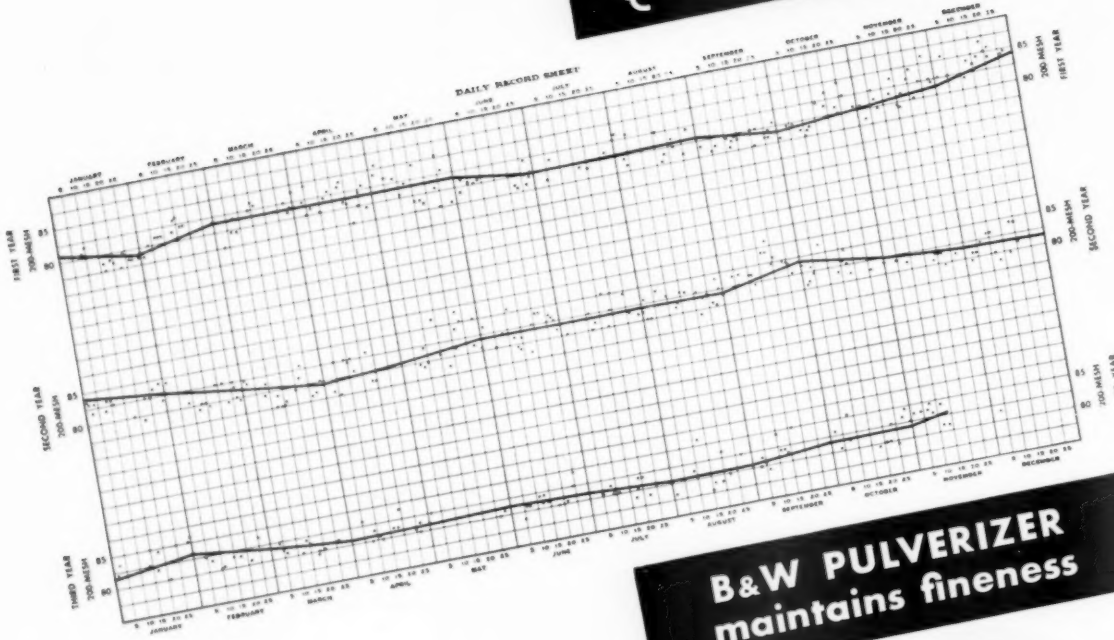
1429 PEACHTREE ST. N.E., ATLANTA 5 • HOBART BLDG., SAN FRANCISCO 4
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

* ® "Dualaire" & "Multiclone" Licensed by H. J. Hersey, Jr.

QUALITY CONTROL



B&W PULVERIZER maintains fineness

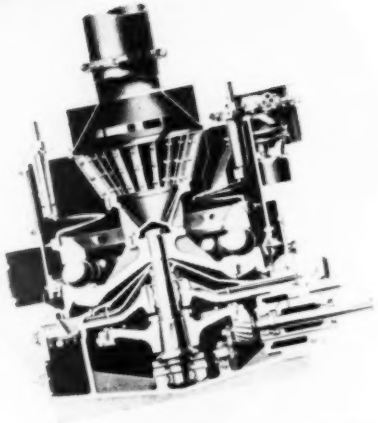


Chart shows record of a B&W Type E Pulverizer over a three-year period. The Babcock & Wilcox Company, Boiler Division, Process Equipment Department, 161 East 42nd Street, New York 17, N. Y.

BABCOCK & WILCOX

C-205

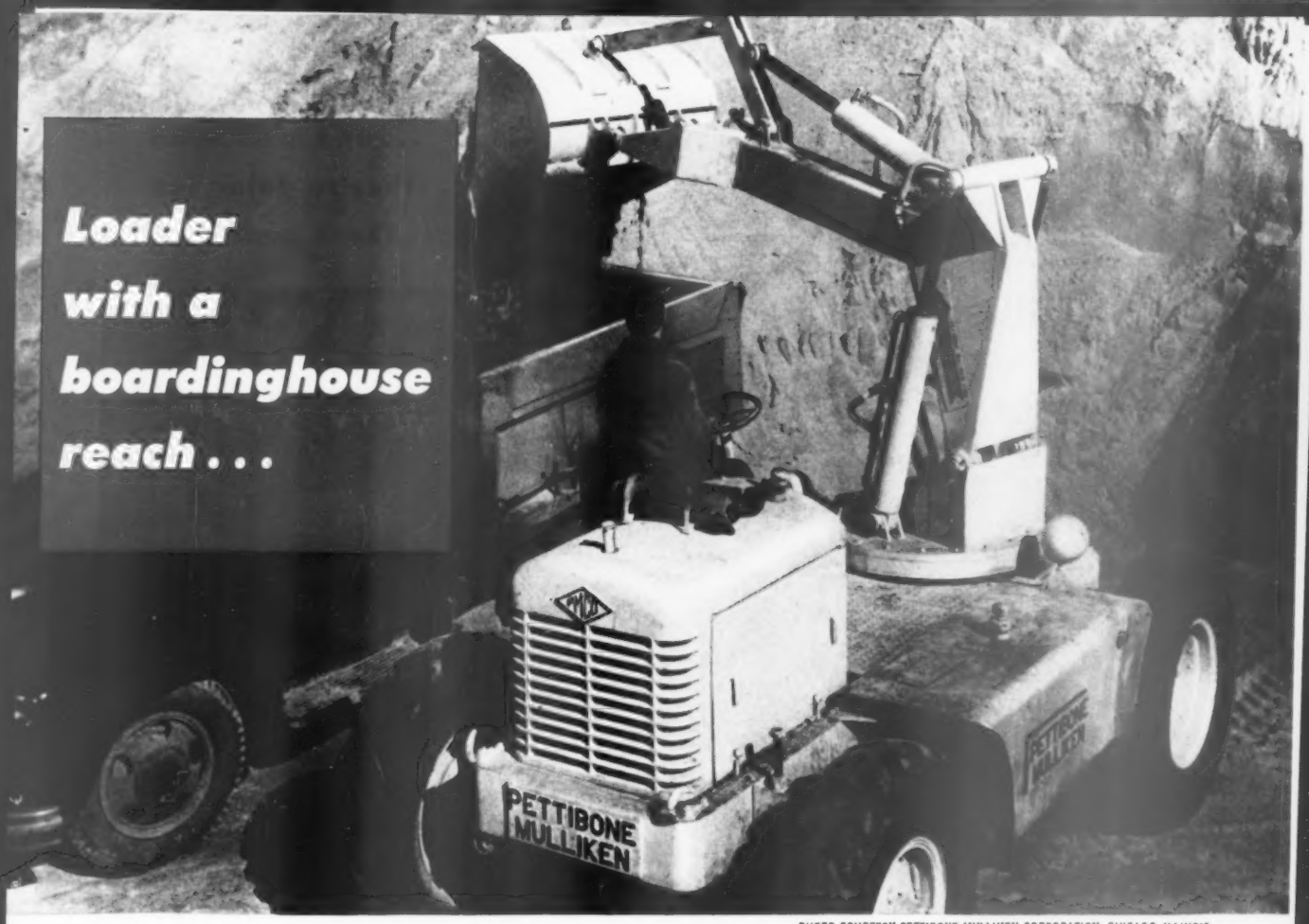


PHOTO COURTESY PETTIBONE MULLIKEN CORPORATION, CHICAGO, ILLINOIS

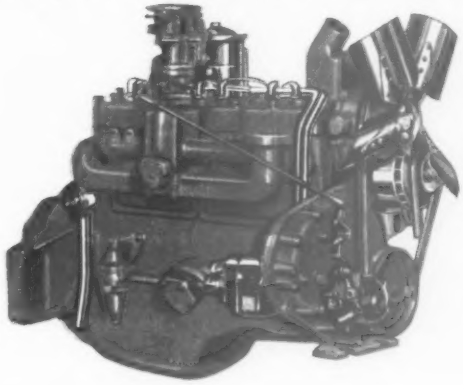
CHRYSLER *Industrial Engine and torque converter assure faster handling of tougher jobs*

This versatile, highly maneuverable loader goes after work like a stevedore after "seconds." Boom swings through 180°, loads faster, in less space, to the left or right without moving from its short, single working line. Cuts loading time up to 25%. Bucket, fork, tote hook and backfiller blade attachments are interchangeable.

Torque Converter provides extra power for tough going, faster acceleration *without* necessity of shifting gears or declutching. Furthermore, the Torque Converter eliminates shock loads to the power train . . . thus reduces maintenance.

Pettibone Mulliken Speed Swing Loaders come in two sizes . . . ¾ cubic yard and 1 cubic yard. Both sizes can be supplied with four-wheel drive (like the unit pictured), and four-wheel steer. Chrysler 230 cubic inches displacement Model 30 Industrial Engine drives the ¾ cubic yard unit, and the 265 cubic inches displacement Model Ind. 16 drives the 1 cubic yard unit. Chrysler Torque Converter connects engine with four-speed transmission, transmits power to boom.

In considering power for your equipment, remember Chrysler Power is not expensive. Production-line methods adapted to specialized industrial engine building provide a custom-built engine at mass-production prices. See a Chrysler Industrial Engine dealer or write: ***Dept. 1211, Industrial Engine Division, Chrysler Corporation, Trenton, Mich.***



CHRYSLER ***Industrial Engines***

INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

HORSEPOWER WITH A PEDIGREE

AGRICULTURE • INDUSTRY • CONSTRUCTION • OIL FIELDS

LOOK AT THESE LORAIN-50 PROFIT BOOSTERS

HYDRAULIC COUPLING — Prevents shocks and stresses from backing up into mechanism and cables—reduces maintenance—increases output. No stall under any digging condition. Standard on only this 1-yard machine.

AIR CONTROLS — Air does the work on the "50" — crawler steering and Tread-Travel Lock use full air power. Air-assist available on hoist, crowd and retract.

4 CRAWLERS — Be "choosy" about your crawler. Select from standard, long, extra-long, and extra-long & extra-wide —to exactly fit your job. Rubber-tire mountings also available.

5 FRONT ENDS—Choose from shovel, crane, clamshell, dragline and hoe—all interchangeable. Your "50" can help you win many bids.

ANTI-FRICTION BEARINGS — Tapered anti-friction turntable rollers—anti-friction bearing mounted Swing Drums—anti-friction bearing mounted Hoist Drums.

Be "CHOOSY" when you buy a Shovel-Crane

Times have changed! Today, you can get most *any* brand you want—when you want it. Not long ago, perhaps you bought just any make of shovel-crane "because it was available". Now you can return to *selective* buying to get the most for your money.

In the 1-yard Lorain-50 "Series" shovel-crane class, as well as in the rest of the wide Lorain line, there are solid values and exclusive design features that pay off in profits. They are not just "gimmicks" to confuse the buyer—but are an honest-to-goodness combination of values that you won't find in any other 1-yard class machine.

Be *"choosy"*. Make sure your shovel-crane investment will pay you greatest profits. Choose from the complete Lorain line —from ½ to 2-yard classes—at your Thew-Lorain Distributor.

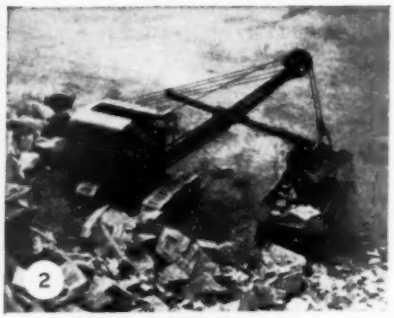
THE THEW SHOVEL CO., LORAIN, OHIO

THEW LORAIN®

SHOVELS • CRANES • CLAMSHELLS • DRAGLINES • HOES

...and look what they're doing for these quarries

1. FOSTER, ALDER & WRIGHT QUARRY
Fayetteville, Tenn.



2. W. E. JOHNSON
Devon, Penna.

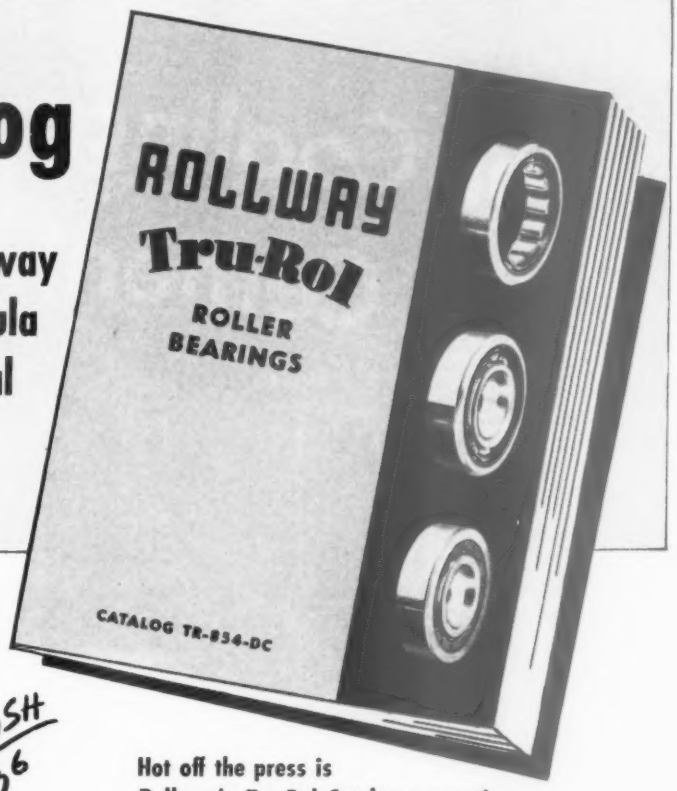
3. CATSKILL MOUNTAIN STONE CO.
White Plains, N. Y.

4. VALLEY VIEW LIME CO.
Lock Haven, Penna.

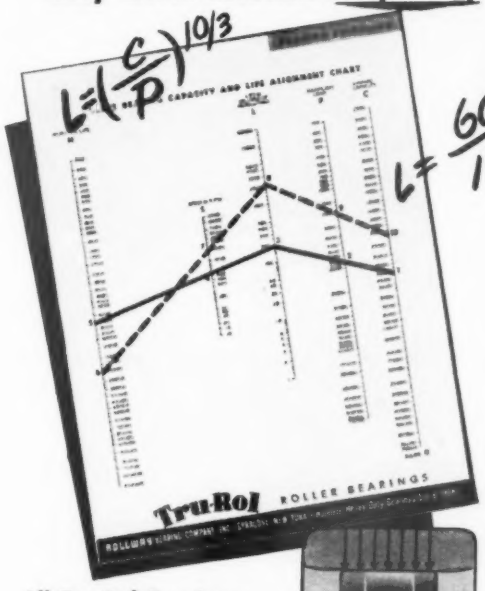
New Catalog

FEATURING

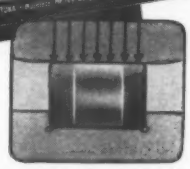
An accurate, simplified way to apply the RBEC* formula when selecting cylindrical Roller Bearings



Easy Quick Solution Graphically



All Tru-Rol Bearings Now Have *Crowned* Rollers



Crowned Roller under full load — stress uniformly distributed.

*Roller Bearing Engineers' Comm.—Anti-Friction Bearing Mfrs. Assn.

Hot off the press is Rollway's Tru-Rol Catalog presenting...

New Rollway Alignment Chart

Now, for the first time, RBEC* formula is converted into simple nomogram! Complicated selection procedure eliminated! Using this graphic method, simply draw two lines—and find in a matter of *seconds* the proper bearing for your application.

Complete Description, Ratings, Dimensions

All the data you require on every size and type of Tru-Rol Roller Bearings. And here is introduced the new, exclusive quality mark in the Tru-Rol field—*Crowned* Rollers! Crowning eliminates end loading, produces uniform stress pattern along full length of roller, and extends bearing life.

SEND FOR YOUR FREE COPY

Included with Rollway's new 36-page catalog are extra copies of the new Alignment Chart. Mail coupon for yours today!

ROLLWAY BEARINGS

COMPLETE LINE OF RADIAL AND THRUST CYLINDRICAL ROLLER BEARINGS

ROLLWAY BEARING CO., INC.
Syracuse 4, N. Y.

Please send free copy of your new Tru-Rol Catalog with extra Alignment Charts.

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SALES OFFICES: Syracuse • Boston • Chicago • Detroit • Toronto • Pittsburgh • Cleveland • Milwaukee • Seattle • Houston • Philadelphia • Los Angeles • San Francisco

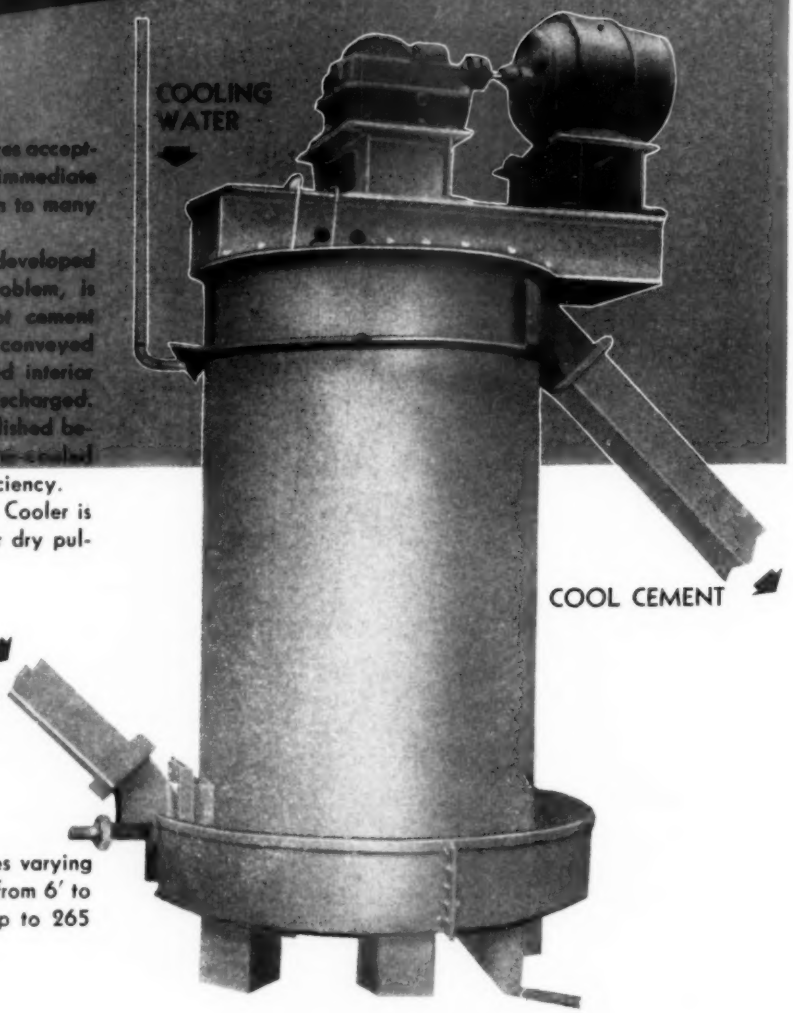
For Cooling Hot Cement

FLS

Cooling hot cement to temperatures acceptable for bulk shipment or immediate bagging is an important problem to many cement manufacturers.

The FLS Cement Cooler, developed especially to overcome this problem, is externally water-cooled, the hot cement being introduced at the base and conveyed in a thin layer along the cooled interior surface to the top, where it is discharged. Thus an intimate contact is established between the cement and the water-cooled surface, assuring high cooling efficiency.

In addition to cement, the FLS Cooler is applicable to many other similar dry pulverized materials.



FLS Coolers are furnished in sizes varying from 3′ to 6′6″ in diameter and from 6′ to 18′ in height, with capacities up to 265 barrels of cement per hour.

F. L. Smidth & Co., A/S
Vestergade 33,
Copenhagen K, Denmark

F. L. Smidth & Co.
11 West 42nd Street
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F. L. Smidth & Co. of Canada, Ltd.
11 West 42nd Street
New York 36, N. Y.

F. L. Smidth & Co. (Bombay) Ltd.
42 Queen's Road
Bombay, India

What's Happening

IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

November, 1954

A new shipping point on the Great Lakes, able to handle about 3,000,000 tons of high-grade dolomite limestone per year, is being readied by U. S. Steel Corp. Named "Port Dolomite," the new port is located between McKay and Bush Bay on Lake Huron, 34 miles south of Sault Ste. Marie, Ont. It will handle limestone from new quarries about 5 miles inland near the town of Cedarville. U. S. Steel Corp.'s Michigan Limestone Div. plans to open the new dolomite quarries and complete construction of processing plants late this fall. Port Dolomite features a 620-ft. dock, equipped with a traveling loading shovel that enables a boat to tie up and be loaded in about 5 hr. without being moved back and forth to receive the various sizes of limestone. Seven self-unloading freighters of the division's Bradley transportation fleet will deliver the limestone to customers on the Great Lakes.

A silicon dioxide compound, said to be 99 percent pure and with individual particle sizes ranging from 10 to 20 millimicrons, has been developed by Dow Corning Corp., Midland, Mich., for use as a reinforcing filler for synthetic rubbers and plastics; a flatting agent and extender for protective coatings; a thickener for lubricating greases; and as an additive in textile finishing. The compound, designated Dow Corning Silica, is produced by burning silicon tetrachloride in the presence of combustible gases. It is said to provide a higher degree of particle separation than silicas formed by precipitation processes, and the particles are said to be well defined and nonagglomerating. The compound reportedly will disperse in elastometric compounds and in solvent, oil, or water-based systems.

The Sudanese government reportedly is trying out a new block press with a view to stepping up the country's lagging housing program. The machine, which is a South African invention, compresses earth into building block. The press is of simple design and the motivating power is compressed air. The daily 7-hr. output of a Sudanese operator averages 800 block. An automatic reloading system enables the machine to maintain continued production. The block, containing only 9 percent cement, are being used experimentally on a house-building project at Omduran. Total cost of each house is about $1120, some $560 lower than the nearest contractor's price.

Concrete vs. asphalt tests are being planned by Alberta, Canada, provincial highway engineers to determine which would provide better service on the province's silty, clay-type soils, as reported in ENGINEERING NEWS-RECORD. Equal 4900-ft. stretches of concrete and asphalt pavement are being built from the junction of the Edmonton-Calgary highway and the Trans-Canada highway north to the Edmonton Municipal Airport. A mile section of pavement made of a rubber and asphalt mixture also will be tested.

Heavy construction awards, nationally, totaled $10,828,000,000 for the first 39 weeks of 1954, as reported by ENGINEERING NEWS-RECORD. This represented a decrease of 5 percent from the record volume during the same period of 1953.

WHAT'S HAPPENING

An abandoned limestone mine at Milltown, Ind., has been put to a rather unusual service. An official of a million-dollar hatchery firm has converted the cave into an underground hatchery. The idea was conceived as an answer to the problem of how to get fertile eggs for hatching in summertime when the hen's egg production and quality fall off because of the heat. The underground cave, covering approximately 25 acres of open space divided by 40-ft.-thick supporting columns, has openings large enough to admit trucks; has a year-around temperature of 56 deg. F.; and contains a well of good water. The firm leased 15 acres of the cave (owned by Louisville Cement Co.), installed fans to circulate the air, laid 1900 ft. of water pipe from the well to two "rooms" screened off in dead-end passages, erected a large feed bin, and built up a floor with corncobs and shucks. A lighting system, timed to wake the chickens at 3:00 a.m. was also installed. The main 100-watt bulbs automatically go off at 5:00 p. m., with 7½-watt bulbs providing 15 more minutes of "dusk"—time for the chickens to find roosts.

A radioactive capsule, about the size of a small automobile fuse, reportedly saved a St. Louis, Mo., steel company about $25,000, as well as keeping plant operations going when they might otherwise have been disrupted for two or three days. The capsule, which was filled with radioactive cobalt 60, detected loose rivets in the company's 450-ton ore bridge used to handle coal, coke, limestone and iron ore in the steel-manufacturing plant. Company engineers had noticed movement in connections between the top girders and vertical pier members of the bridge, but couldn't find what caused the sway without dismantling part of the bridge. Technicians from a local testing laboratory were called in to take radiographic pictures which showed the sway resulted from loose rivets, thus saving a costly dismantling job.

A 4-year residential building course, leading to a degree, has been established at Michigan State College. The course reportedly was established because of lack of college-trained personnel in the industry. The course has been designed to meet the needs of the home-building field, with the need of practical experience being recognized by requiring that 16 weeks, exclusive of the course work, be spent in some on-the-job phase of the industry. Graduate work leading to a master of science degree is also being offered. The annual production of homes is said to exceed 1,000,000 units with an aggregate value of nearly $12,000,000,000, thus being an important segment of the building industry.

A taconite processing plant is being built at Reserve Mining Co.'s E. W. Davis works in Silver Bay, Minn., at a cost of approximately $19,000,000. Arthur G. McKee & Co., Cleveland, Ohio, and Allis-Chalmers Manufacturing Co., Milwaukee, Wis., are providing the designing, engineering and testing for the installation, which will include a 1¼ million pound gyratory crusher with a capacity of 3500 t.p.h. The project is part of an $180,000,000 taconite development program being conducted by Reserve Mining Co., which is owned jointly by Republic Steel Corp. and Armco Steel Corp.

Construction has been started on what is claimed will be the longest prestressed concrete span in the western United States. A 240-ft. twin span is being built across the Klickitat River on the Goldendale-Lyle road about 30 miles northwest of Goldendale, Wash. Cost of the double span was estimated at $97,247.

THE EDITORS

ALLIS-CHALMERS
Air-Quenching
COOLER

FIND OUT—How Many Ways This Cooler Can Cut Costs for You!

SAVE ON INSTALLATION You save up to 30% on installation costs over comparable coolers. Pre-tested and pre-assembled, your cooler is shipped to your site in two sections where it is easily installed without costly revamping of plant. Less headroom is required — there are fewer costly auxiliaries.

SAVE ON FUEL Movable baffle in air housing above clinker bed isolates and directs hottest air to kiln. Combustion efficiency is greatly increased.

SAVE ON POWER Uniform bed of material passing over grating requires only low pressure air. Comparatively smaller fan and motor uses only about ½ hp-hr per barrel of clinker. Fewer auxiliaries to drive.

SAVE ON MAINTENANCE Simplified design and small number of parts require little attention. Low upkeep cost. Lubrication is required only on drive mechanism. Only four grease fittings. Horizontal grate system insures smooth flowing bed of material and high efficiency cooling throughout. There is little or no wear on grates or grate warpage. Maintenance is only about 1/10 cent per barrel of clinker.

SEND FOR NEW HANDBOOK ON Air-Quenching Coolers

Contains valuable engineering information on cooling that can help make your operations more profitable! It's a book you'll want to have and keep.

ALLIS-CHALMERS
Milwaukee 1, Wis.

Please send my copy of Air-Quenching Cooler Bulletin 07B7869.

Name .....

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A-4262

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

an EXTRA MARGIN of Strength

without Excess Weight

The unique two-section boom used on Bucyrus-Erie 4½- to 8-cu. yd. Ward Leonard electric shovels solves one of the problems of front-end construction on heavy-duty excavators in a sound, practical way. It provides the strength needed to withstand the shock loads of digging, yet is remarkably light in weight to help keep swing inertia low.

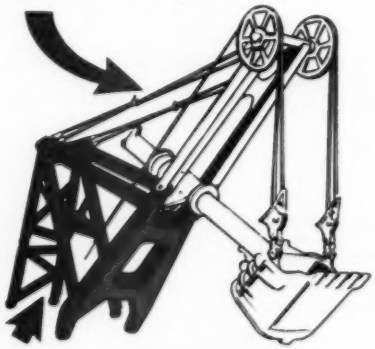
The two-section boom is only one example of *that extra margin* built into Bucyrus-Erie heavy-duty excavators—an extra margin in design *that pays off in extra loads and more output*. There's much more to the story—the tubular dipper handle, the independent rope crowd, the twin dual hoist ropes, the deck location of crowd machinery, the improved dipper design. Write for complete information on the model of your choice—the 4½-yd. 110-B, the 6-yd. 150-B, and the 8-yd. 190-B.

21154C

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

Upper boom section, bridge-strand connected to the A-frame, is relatively lighter in construction, because it has to carry only the loads resulting from the pull of the hoist ropes and from the acceleration and deceleration of the swing.



Sturdy lower section, securely attached to the A-frame by pin-connected struts to form an integral part of the machine, has ample strength to take the stresses and shock loads of the digging cycle. Widespread boom feet provide a brace effect to take swing loads . . . no cable suspension or sway braces are required.

two-way side dumping eliminates truck tie-ups ... keeps rock production high

Assurance of constant, smooth flow of rock from quarry to crusher and elimination of costly truck delays have been achieved by Buffalo Crushed Stone Co. of Bowmansville, N. Y. through a flexible system of two-way side dumping at the crusher.

The greater flexibility of this system was achieved by converting from single truck units to truck-trailer combinations—thus doubling payload capacity for stepped-up production. Since all the dump bodies are designed for two-way dumping, the trucks can roll in on either side of the crusher. Remote-control overhead dumping system enables one man to control the feeding rate and the crusher operation. Feed is uniform...truck delay is eliminated.

Each of the six trucks hauls 28 tons in two side-dump bodies; 14 tons on the truck and 14 on the trailer. They handle grades up to 10% and roll at speeds up to 27 m.p.h. on the level. Each truck makes 22 trips daily between the quarry and the crusher, hauling a total of 3700 tons and using only 1.2 gallons of diesel fuel per hour per truck.

In switching to tandem operation, Buffalo Crushed Stone Co. knew they had a job calling for trucks that "have what it takes." Result: They bought Macks—six Model B-61 six-wheelers powered by Mack Thermodyne® Diesels, and equipped with heavy-duty Mack transmissions to meet stiff grade requirements.

On your job, too, Mack trucks can make the big difference by hauling more—for less.

2716

MACK TRUCKS Empire State Building, New York 1, N. Y.

Stays out of the shop, stays on the job!

LE ROI TRANSO
Unitized design simplifies maintenance
4-wheel drive traction reduces engine strain and tire wear
Torque converter provides smooth flow of power... cushions shock

Le Roi-Transo TLF-150 Front-End Loader

YOUR first look at a Le Roi-Transo TLF-150 tells you it's got guts — guts aplenty! And Le Roi-Transo engineering is the reason.

Because of Le Roi-Transo engineering, your TLF-150 is seldom tied up in the shop. Because of Le Roi-Transo engineering, you load faster, travel faster, and dump faster — in sand, mud, snow, or rocky terrain.

Le Roi-Transo design assures you of less downtime these and other ways:

- Engine, transmission, clutches, axle assembly, and torque converter are grouped compactly and are easy to get at. You save maintenance, time and labor. For example, it takes *less than an hour* to replace the spring-loaded clutch.
- Patented "bucket-rocking action" helps you get a full bucket load within seconds, without tire-spin or undue strain on the loader.
- Torque converter assures smooth flow of power to all four wheels — gives you sure-footed traction, reduces engine strain and tire wear.

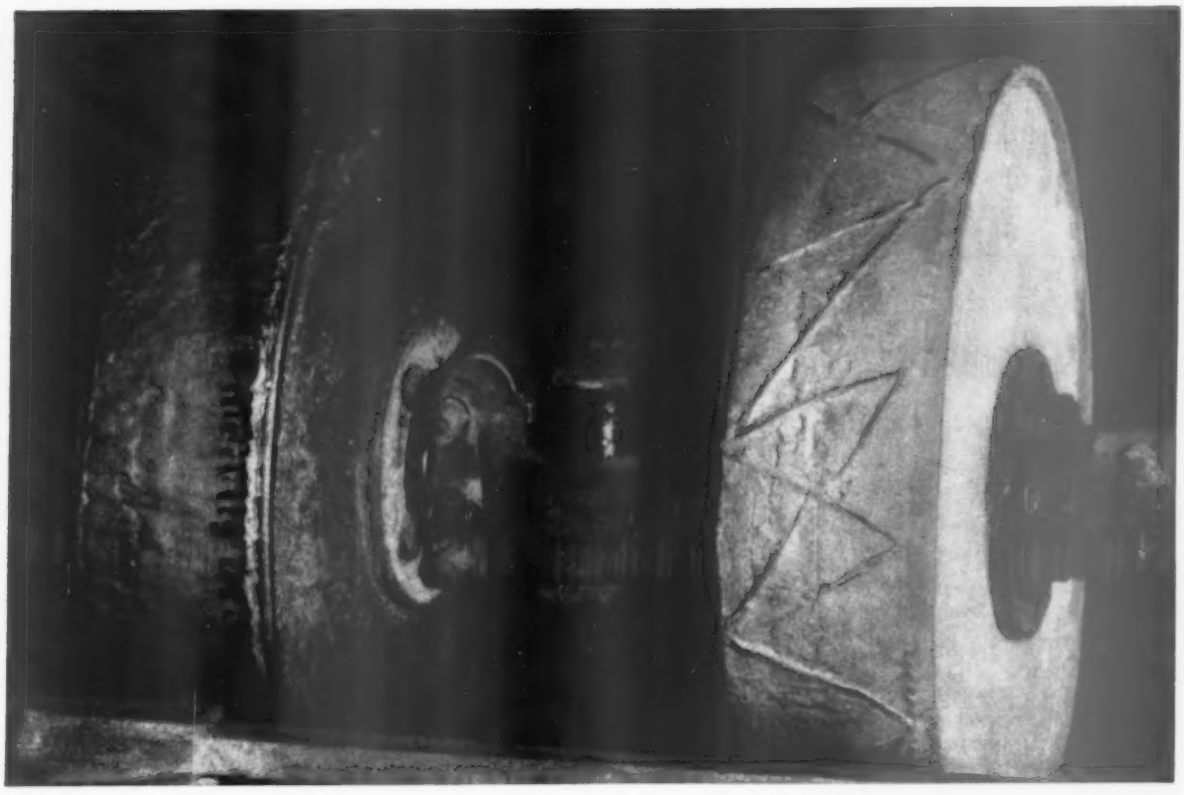
It's design details like these that help Le Roi-Transo TLF-150 save important time and money for you.

Have your Le Roi-Transo distributor arrange a demonstration, so you can see *all* the reasons why it pays to use a Le Roi-Transo TLF-150 on your material-handling jobs. TD-15

Note how compact arrangement of transmission, clutches, and torque converter puts transfer case conveniently at rear, so by merely removing the rear grill you can replace transmission clutch in less than 60 min.
TRANSO
LE ROI

LE ROI COMPANY

A Subsidiary of Westinghouse Air Brake Co.
TRANSO DIVISION
MILWAUKEE 14, WISCONSIN
Plants: Milwaukee • Cleveland — Greenwich — Dunkirk, Ohio • Coldwater, Mich.



Crushing Life Increased 14 Times *by* **Hard-Facing**

The hard-faced rolls on this rock-crusher mill have been in constant operation for six years. During this time, the rolls have been pulverizing such abrasive materials as ferro-alloys, ore, dolomite, feldspar, rock, sand, and clay used for making brick. Unprotected rolls, performing the same operations, had to be replaced every four or five months.

The serrated roll shown at the right in the photograph is the roughing roll used for initial grinding or milling. The smoother roll, at the left, is a finishing roll used to grind the abrasive materials into a powder. Both rolls were hard-faced with HAYNES STELLITE alloy by the metallic-arc process to protect them from abrasion.

There are 14 HAYNES alloys . . . each developed to resist certain conditions of wear. Some of these alloys are hard and abrasion-resistant, some are tough enough to stand up under heavy impact . . . others resist corrosion, erosion, or heat. Use them to protect bull-dozer blades, dipper bucket teeth, sheepsfoot tampers, tractor rollers and other metal parts exposed to wear.

Your dealer carries a complete line of HAYNES hard-facing rods. Ask him for our descriptive literature. If you don't know the location of your local dealer, write to Haynes Stellite Company, a Division of Union Carbide and Carbon Corporation, Kokomo, Indiana, for full details.

See... Your local Haynes Stellite Dealer

— or —

Write... to Haynes Stellite Company

"Haynes" and "Haynes Stellite" are registered trade-marks of Union Carbide and Carbon Corporation

All four plants of the McLELLAN STONE CO. are TELSMITH Equipped

● The McLellan Stone Co. operates four Telsmith-equipped crushing plants in the south central part of Kentucky. These plants produce crushed stone which meets Kentucky state highway specifications, as well as aggregate for local construction purposes. The company has been in active operation for over forty years under the guidance of the late James C. McLellan. The four plants are now operated by his sons George, David, Robert and William McLellan. These plants include four Telsmith Heavy-Duty Apron Feeders, four Telsmith Primary Crushers, six Telsmith Secondary Crushers, and twelve Telsmith Vibrating Screens. The McLellans are well satisfied with Telsmith Equipment.

Send for Bulletin 266.

TELSMITH equipment in these McLellan plants

36″ x 14′ Heavy-Duty Apron Feeder
36″ x 12′ Heavy-Duty Apron Feeder
Two—36″ x 10′ Heavy-Duty Apron Feeders
Two—18″ x 32″ Jaw Crushers
20-B Gyratory Crusher
16-B Gyratory Crusher
10-B Gyratory Crusher
48-S Gyrasphere Crusher
Three—36-S Gyrasphere Crushers
36-FC Gyrasphere Crusher
4′ x 10′ Heavy-Duty Scalper
Eleven—4′ x 12′ Vibro-King Screens

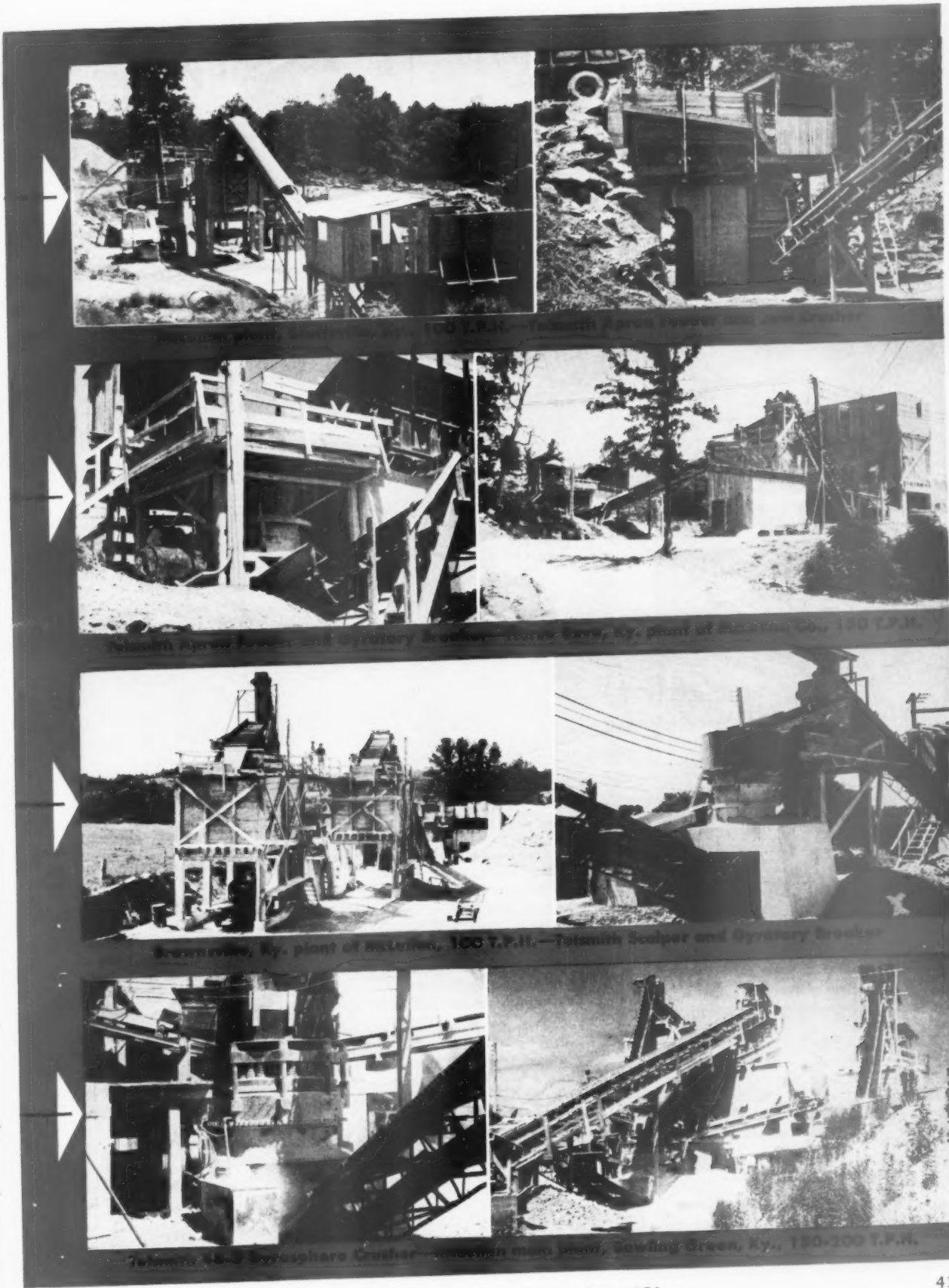
TELSMITH ENGINEERING WORKS, 908 S. CAWKER DRIVE, MILWAUKEE 1, WISCONSIN

Cable Address: Sengworks, Milwaukee

51 East 42nd St. New York 17, N. Y. | 100 West Monroe St. Chicago 3, Ill. | 713 Commercial Trust Bldg. Philadelphia 2, Pa. | 238 Main Street Cambridge 42, Mass. | Boehck Eqpt. Co. Milwaukee 3, Wis. | The McLean Co., 3525 Lakeside Ave. Cleveland 14, Ohio

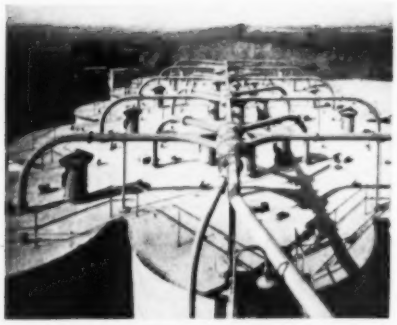
Marens Eqpt. Co., New Hudson, Mich. • Rish Eqpt. Co., Cincinnati 14, & Portsmouth, O.—Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 10, Va. Robert S. Bailey, 816 W. 5th St., Los Angeles 17, Calif. • Mines Eng. & Eqpt. Co., San Francisco 4, Calif. • Clyde Eqpt. Co., Portland 9, Ore., & Seattle 4, Wash. Brandeis Machinery & Supply Co., Louisville 8, Kentucky; Evansville, Indiana; Middlesboro, Kentucky; Paducah, Kentucky

QS-29

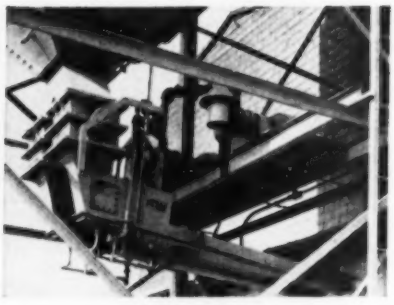


Conveying dry bulk materials?

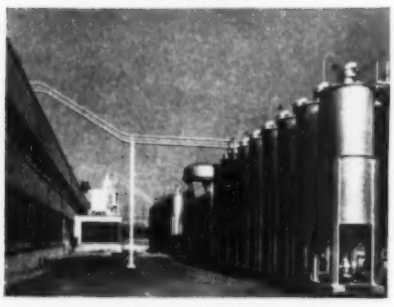
FULLER gives you specialized engineering from its many years of experience



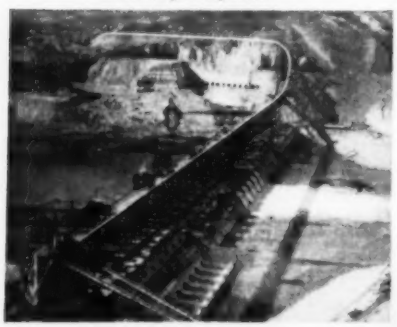
Fuller-Kinyon System



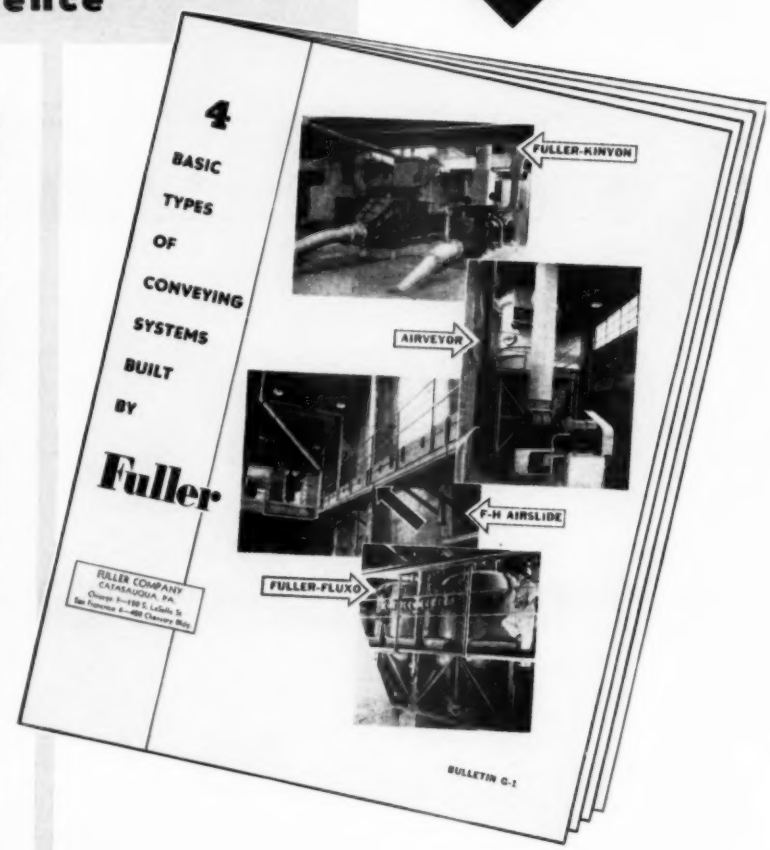
F-H Airslide



Airveyor System



Fuller-Fluxo System



The experience of over a quarter of a century in research, designing, and building various types of air-conveying systems, has given Fuller engineers a vast amount of "know-how", knowledge which is passed along to the purchaser in better and more efficient equipment.

When you have a problem of conveying dry, pulverized and granular materials, Fuller is the name to remember. Builders of four basic types of systems, it can readily adapt a system to fit into your plant, for the material to be handled. Thousands of Fuller systems are at work, day after day, in industry the world over, helping to cut costs to the minimum.

Write for Bulletin G-1, which will give you quite a comprehensive insight into the facts of air-conveying. It may be that you have never given any thought to this method of handling bulk, raw materials . . . it may well mean a first step forward toward consistently profitable operation and a smoother flow in production. Write us today.

FULLER COMPANY, Catasauqua, Penna.

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DRY MATERIAL CONVEYING SYSTEMS AND COOLERS—COMPRESSORS AND VACUUM PUMPS—FEEDERS AND ASSOCIATED EQUIPMENT

G-98
9715

LONG ON OUTPUT
SHORT ON UPKEEP

THE 480-W is one of the Bucyrus-Erie walking draglines which have proved so popular for stripping. It is available with either diesel or Ward Leonard electric power, and with combinations of 175 to 215 ft. booms and 8 to 12 yd. buckets. Other Bucyrus-Erie walking draglines have bucket sizes from 4 to 30 yd. and boom lengths from 110 to 235 ft.

Long working reach, large capacity and easy, accurate move-ups are some of the characteristics that make Bucyrus-Erie walking draglines "long" on output for economical stripping.

The many users of these outstanding machines have found them equally "short" on upkeep. This reflects careful, proved engineering, and correct balance of weight, power and strength that helps hold down wear and lengthen life.

If you are interested in big-capacity, low-cost stripping, let us tell you more about features that have made Bucyrus-Eries the world's most preferred walking draglines.

11L54C

South Milwaukee **BUCYRUS ERIE** Wisconsin

NOTHING STOPS a mighty Manitowoc 4500!

Not even this solid mass of rugged rock can stop a powerful Manitowoc 4500! Yard after yard — load after load — this mighty of the mightiest keeps right on smashing out profitable tonnage.

It can't be beat as a shovel — handles up to 5½ yards of rock like a handful of peanuts. Single, free-turning tubular stick rolls through saddle and makes digging shocks harmless. Complete diesel operation permits traveling anywhere without a trailing cable or electric supply.

It can't be beat as a dragline — it's "steady as she goes", with a low center of gravity; wide, long crawlers — providing maximum stability for long reaching booms — features that mean full capacity buckets on every dragline job.

The 4500 main machinery is simple, powerful and fast, with only 15 gears and 8 sprockets — no lost motion — less maintenance and easy to service. All these advantages, plus the added power and performance of Manitowoc Torque Converter application.

See and get the facts on Manitowoc before you buy your next shovel or dragline.

MANITOWOC

SHOVELS 1-5 YD. Speedcrane CRANES 18-100 TON

Thermoid Hose designed specifically for use in quarries

Thermoid designs and manufactures many types of hose built to give longer service and lower operating costs in a wide variety of specific applications. Here are three that are ideal for rugged quarrying and construction work:

THERMOFLEX—Mandrel-built air hose for extreme service and direct connection to compressors. Smooth, black abrasion-resistant cover.

VERSICON—Most versatile hose ever developed. Handles air, water, oil, gasoline, dilute acids and gases. Ideal for use with air-operated tools.

#325 CL SUCTION HOSE—Heavy duty wrapped hose reinforced with rugged wire enclosed in a woven cord carcass. Long wearing tube and cover resists weather and abrasion. Can be restored to shape after crushing.

Thermoid research is responsible for new, better hose construction which makes Thermoid Hose more durable . . . easier to handle. Quarrying and construction work also demands the best in Conveyor Belting and Multi-V Belts. Ask your Thermoid Distributor for complete information on all these Thermoid Products. Or if you prefer, write direct.

Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

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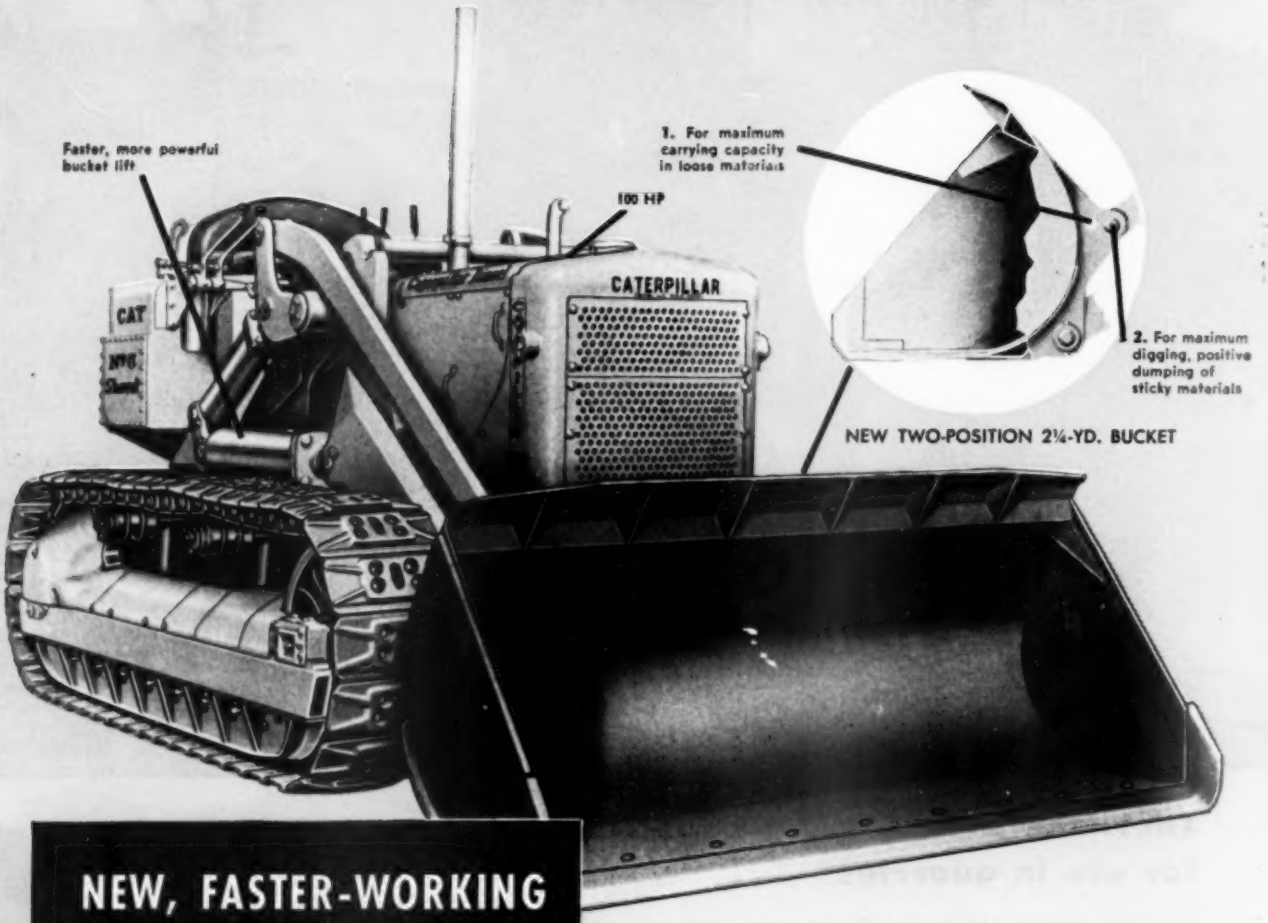
Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

ANNOUNCING


Faster, more powerful bucket lift
100 HP
CATERPILLAR
CAT
1. For maximum carrying capacity in loose materials
2. For maximum digging, positive dumping of sticky materials
NEW TWO-POSITION 2¼-YD. BUCKET

NEW, FASTER-WORKING NO. 6 SHOVEL at no increase in price

NEW POWER—the CAT* Diesel Engine now gives you 100 HP, an increase of approximately 25 per cent—and you get it with Caterpillar ruggedness and economy.

NEW 2¼-yd. BUCKET gives you 12½ per cent more capacity, gets heaping loads, dumps cleanly. Exclusive two-position feature gives maximum use of bucket capacity in *any* material: rear position for clean, fast dumping of sticky materials; forward position for carrying heaping loads of loose materials.

GREATER LIFTING POWER and speed with new hydraulic pump: its pressure is stepped up more than 40 per cent for fast, positive lifting action under *all* load conditions.

These extra values cost you no more in price!

These useful attachments increase your job range: skeleton rock bucket, quarry bucket, heavy-duty narrow bucket and bulldozer blade.

Versatile new No. 6 Shovel is built to do more work at less cost

Weight distribution, engine horsepower and bucket capacity are carefully balanced so that the tracks *stay* on the ground for maximum stability.

Your Caterpillar Dealer will be glad to demonstrate the new No. 6 Shovel *on the job*. See him today. And count on him for fast service and genuine factory parts.

Caterpillar Tractor Co., Peoria, Ill., U.S.A.

CATERPILLAR*

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NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

States to Have More Power in Labor Disputes

LABOR LEADERS have finally lost hope in gaining repeal of the Taft-Hartley Law and they have shifted their attack, for political purpose, to the National Labor Relations Board as set up to administer the Taft-Hartley Law.

The National Labor Relations Board has very substantially revised the standards used in determining whether to exercise its jurisdiction in cases that come before it. These changes have the effect that the Board will not assert its jurisdiction in certain cases involving smaller companies whose operations have little, if any, real effect on interstate commerce.

Unions Object

Labor unions are denouncing the move and specific actions of the Republican majority on the Board, and they have come up with many reasons why their members should vote Democratic. They disapprove recent actions which have resulted in the scrapping of old rulings as those cases have come under re-examination.

One of the distasteful changes as far as unions are concerned is the action which has thrown out the prohibition against employers questioning workers as to their union affiliation. The position now taken is that such questioning is legal if there be no threat of reprisal or promise of benefit. That change certainly seems logical if impartial interpretations be given.

The matter of group bargaining by employers, in efforts to defend themselves against union strikes that single out one employer in an industry for attack, has been interpreted to the just advantage of small employers.

Earlier decisions had held that when a union strikes just one employer of a group bargaining as an association, that the rest could not retaliate by shutting down their operations. They now can shut down as a "defensive" measure, which ruling is unsavory to some unions. Unions no longer can divide and conquer industries so organized, by seeking out the weaker or more susceptible company and coercing it to capitulate by any means.

This ruling is extremely important to many industries made up of small employers which had no protection against ruthless, prevailing practices of unions unless they could organize effectively for defense.

It is of particular interest that unions have become aroused about a new policy that restricts the application of the very "slave labor law" which they so long have protested.

When the board set up the new standards for exercise of its authority, exempting from the Taft-Hartley Law many small concerns and millions of workers whose relation to interstate commerce is small, many such businesses will come under state laws.

It is this contraction in jurisdiction of the board that has come in for critical attack, thus bringing out an admission by some labor union leaders that Taft-Hartley wasn't so bad after all. They are now saying that millions of wage earners are being deprived of the "protection" that the Taft-Hartley Law offered against employer unfair labor practices and that workers so affected need protection more than those employed by the larger industrial concerns.

States' Challenge

The law is still indefinite on some questions of state and federal jurisdiction in the field of labor law and, if the Board's standards for jurisdiction do not cover a particular case, the problem is whether aid should be sought from state or federal forums. Particular cases as they come up will help clarify the question, but it would have simplified matters if federal legislation had specifically outlined the limits of federal power. Then the states would feel free to act with assurance in settling labor dispute cases on their own.

The one thing that is absolutely certain is that the National Labor Relations Board is determined to withdraw from strictly local disputes and that the separate States must be prepared to handle labor-management problems that will arise in the zone from which the Board has withdrawn.

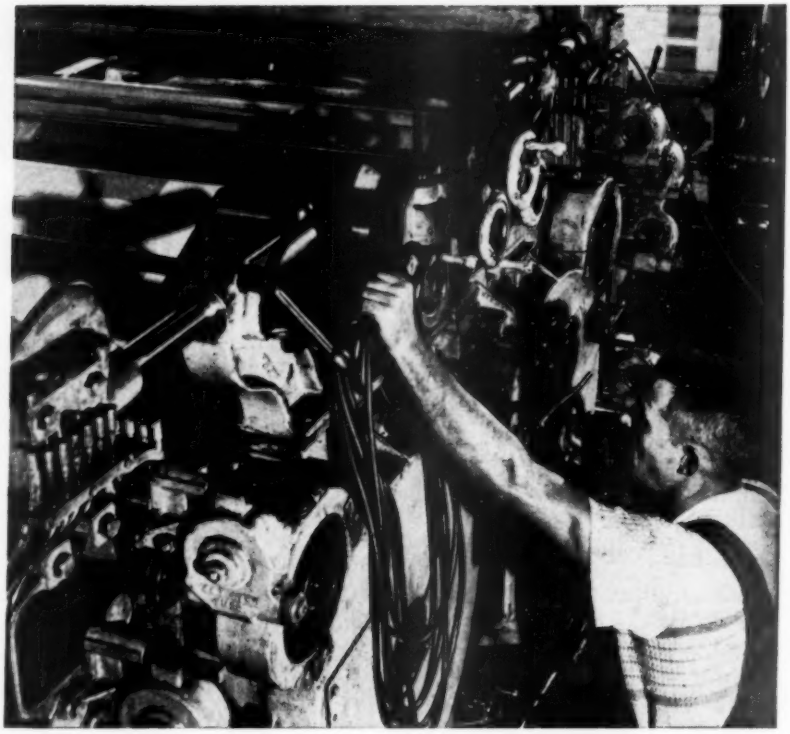
It will set up a challenge for the States to prove to labor and management, and the federal government and general public, that they can speedily resolve the problems of labor and management. They will have to demonstrate that they are prepared and able to protect the rights of employes to bargain collectively and that they can protect the public welfare in the process.

Unions seem afraid to risk their chances with State labor laws, but they must also realize that some companies that have benefitted from Taft-Hartley may have to contend with state laws that are less considerate of the employer's side. In general, it would seem that the state level has advantages because state protection against ruthless practices would be more readily available.

State legislatures will be screening their labor laws and employers should become concerned and express themselves on state labor law proposals that will arise.

Bror Nordberg

How Bemis makes GOOD multiwall bags for you



As with other types of printing, there is no substitute for experience in multiwall paper bag printing. A typical Bemis pressman is Wesley Pitcher, shown here at the 4-color press he operates at the Bemis plant in Peoria. Wesley went to work in the printing department 21 years ago and has been a pressman for 18 years.

Good bag printing requires *three* things . . . and Bemis has 'em!

Good multiwall bag printing . . . the kind that makes your brand a star salesman . . . requires good presses, good plates and good workmen. *And Bemis has 'em!*

1. Specially designed presses . . . with features needed for *best multiwall printing* . . . are used.

2. Our own skilled, experienced plate makers make our printing plates . . . so we control quality every inch of the way.

3. Since we have been making and printing quality multiwalls for twenty-seven years, we have trained our pressmen to the point that they do, day in and day out, the best printing in the bag industry.

Bemis

General Offices—St. Louis 2, Mo.
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BEMIS BRO. BAG COMPANY

®

Lack of Vigilance Over Trust Funds

ROCKY'S NOTES

NATHAN C. ROCKWOOD

THERE IS A PART of the Labor-Management Relations Act (Taft-Hartley) that some employers, apparently, are not any too familiar with. This is Title III — Restrictions on Payments to Employe Representatives, Sec. 302 (a) of which reads: "It shall be unlawful for any employer to pay or deliver, or agree to pay or deliver any money or other thing of value to any representative of any of his employes who are employed in an industry affecting commerce." Sec. 302 (b) makes it unlawful for any representative of the employe to accept such payment.

Under (c) in the same section, it is stated: "The provisions of this Section shall not be applicable * * * * (5) with respect to money or other thing of value paid to a trust fund established by such a representative, for the sole and exclusive benefit of the employes of such employer, and their families and dependents (or of such employes, families, and dependents jointly with the employes of other employers making similar payments, and their families and dependents); *Provided*, that (A) such payments are held in trust for the purpose of paying, either from principal or income, or both, for the benefit of employes, their families and dependents, for medical or hospital care, pensions on retirement or death of employes, compensation for injuries or illness resulting from occupational activity, or insurance to provide any of the foregoing, or unemployment benefits or life insurance, or accident insurance; (B) [*Provided*] the detailed basis on which such payments are to be made is specified in a written agreement with the employer, and the employes and the employers are equally represented in the administration of such fund, together with such neutral persons as the representatives of the employers and the representatives of the employes may agree upon; and in event the employer and employe groups deadlock on the administration of such fund, and there are no neutral persons to break such deadlock, such agreement provides that the two groups shall agree on an impartial umpire to decide such dispute, or in event of their failure to agree within a reasonable length of time, an impartial umpire to decide such dispute shall, on petition of either group, be appointed by the district court of the United States for the district where the trust fund has its principal office, and [*Provided*] the agreement shall also contain provisions for an annual audit of the trust fund, a statement of the results of which shall be available for inspection by interested persons at the principal office of the trust fund, and at such other places as may be designated in such written agreement; and (C) such payments as are intended to be used for the purpose of providing pensions or annuities for employes are made to a separate trust which provides that the funds held therein cannot be used for any purpose other than paying such pensions or annuities. (D) Any person who wilfully violates any of the provisions of this section shall, upon conviction thereof, be guilty of a misdemeanor and be subject to a fine of not more than $10,000 or to imprisonment for not more than one year or both."

Plenty of Violations

If we can believe the newspaper reports there are plenty of violations of this section of the law, and it appears that the local unions of the Teamsters' International union, with which most of our readers have dealings, are in the forefront. In some instances, apparently, payments made by employers to union representatives were more in the nature of supporting rackets for preventing labor harassment than for actual welfare funds to benefit their employes. Evidently, under such conditions some employers feel that they can wash their hands of any responsibility for what happens to these contributions, after they have left their hands. An employer who does think so, obviously thinks wrong, for while the quotation from the law (given above) may be long and involved, it certainly is not ambiguous. Clearly the employer must have equal representation among the trustees who administer the fund; if he hasn't, he is violating the letter of the law; if he has, and those trustees in disgust or otherwise, by inaction, fail to exert their powers, as the law specifies, they certainly are guilty of malfeasance in their office as trustees.

We know that employers have sometimes taken the position that they are helpless to combat an entrenched gang of labor racketeers or crooks, who may be in control of the union and its funds, but they are false to their own employes, as well as to the public trust imposed upon them, if they do not exercise every right given them under the law to protect their employes. To be sure the law probably needs to be supplemented with more specific provisions outlining the rights, powers and obligations of trustees to prevent such dissipation of union welfare funds as recent investigations have exposed, but the law as it stands today is clear as to its intent and purposes. It says nothing about the civil responsibilities of the trustees, but these are present under common law. Let some catastrophe occur, such as widespread unemployment of truckers, and let their family sickness and hospital bills run up, with a union treasury empty of welfare funds because of criminal acts on the part of someone, and of negligence on the part of the trustees; and we would probably see plenty of lawsuits to compel employers to make good their own payments that they were so unwise as to allow to be dissipated.

No Source of Joy

There may be some few employers who can view these raids by crooks on union treasuries with a feeling that they may help to destroy unions, or at least the faith of union members in their union bosses. Such abuses obviously will lead to more laws and more shackles for union bosses. But the more government regulates unions, the more it will eventually regulate other avenues of freedom of enterprise, and the nearer we shall approach a socialistic state, where in despair both labor and enterprisers will ask the government to take over more and more. Logically, the experience of labor unions with crooked management of their welfare funds (and F.H.A. funds under recent Federal Administrations) should prove to them what actual government socialism would be like; it should teach them that the only real cure is in their own democratic action, to take part in union elections and to pick out for positions of trust the honest men among them, and these constitute the great majority. Such men may lack present experience in handling and investing large sums of money, but here the employer repre-

(Continued on page 104)

Take a tip from WAPAK SAND & GRAVEL CO.

THIS SUCCESSFUL PRODUCER USES EAGLE WASHING-CLASSIFYING EQUIPMENT *Plus* an EAGLE "Swintek" Dredging Ladder

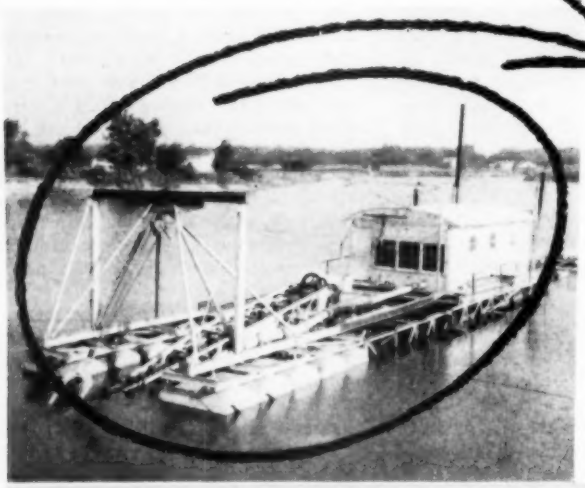
WAPAKONETA, OHIO

Since 1948 Wapak Sand & Gravel Co., has processed material at their busy plants with Eagle Double Screw Fine Material Washer-Classifier-Dehydrators.

At the plant pictured the winning combination of an Eagle Water Scalping Tank and an Eagle Double Screw Fine Material Washer is giving Wapak clean, classified sand to exact classification—material that finds a ready market. Radial stacking conveyor permits easy stockpiling of various gradations of sand that are produced.

A significant fact about Eagle Washing-Classifying Equipment is that producers in Ohio — and elsewhere — have reordered again and again.

EAGLE "Swintek" DREDGING LADDER AT WAPAK IS OF PRACTICAL DESIGN



The Eagle 40′ Light Duty Traveling Screening Chain Dredging Ladder installed on the dredge at Wapak's plant, pictured left, greatly increased the capacity of the dredge, which has a 6″ pump. Clogged suction lines have been eliminated . . . ratio of solids to water pumped is far greater. Pontoon system for supporting the "Swintek" is pivoted or hinged on the sides of the dredge at the very center. Any dredging load applied is always at the center, so dredge remains level at all times.

Get the facts on profit-proved Eagle Equipment for Aggregate Producers!

EAGLE IRON WORKS, 137 Holcomb Ave., Des Moines, Ia.

Screw Washers

Log Washers

"Swintek" Dredge Ladders

Breaker Balls and Pile Hammers

EAGLE IRON WORKS

LABOR RELATIONS TRENDS

By NATHAN C. ROCKWOOD

Truck Drivers Enjoined in Secondary Boycott

WE HAVE TO RECORD A DECISION of the U. S. District Court, Northern District of Georgia, in a case that we have been waiting for. It involved picketing a construction job to attempt to compel a ready-mixed concrete producer to reinstate some fired truck drivers. The case is Getreu, etc. v Sales Drivers, Helpers and Building Construction Drivers, Local Union No. 589, A.F. of L. The regional director of the National Labor Relations Board, John C. Getreu, petitioned the court for a temporary injunction to restrain the union from picketing construction jobs of contractors who were not involved in any labor dispute but were customers of the ready-mixed concrete producer, the Campbell Coal Co., Atlanta, Ga.

Court's Decision

What follows is the complete record of the decision by Judge Sloan: "This cause came on to be heard upon the verified petition of John C. Getreu, regional director of the Tenth Region of the National Labor Relations Board (herein called the Board), for a temporary injunction pursuant to Section 10(1) of the National Labor Relations Act, as amended (herein called the Act), pending the final adjudication of the Board with respect to this matter, and upon the issuance of an order to show cause why injunctive relief should not be granted as prayed in said petition. Respondent filed an answer to said petition. A hearing on the issues raised by the petition and answer was duly held on August 9, 1954. All parties were afforded full opportunity to be heard, to examine and cross-examine witnesses, to present evidence bearing on the issues, and to argue and submit briefs on the evidence and the law. Having fully considered the petition, answer, evidence and arguments and briefs of counsel, the court, upon the entire record, makes the following:

Findings of Fact

"(1) Petitioner is regional director of the Tenth Region of the Board, an agency of the United States, and files this petition for and on behalf of the Board.

"(2) Respondent, Sales Drivers, Helpers and Building Construction Drivers, Local Union No. 859, International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America, A.F. of L. an unincorporated association, is a labor organization within the meaning of Section 2(5), 8(b) and 10(1) of the Act, with its principal office at Atlanta, Ga., and at all times material herein, has been and is now engaged within this judicial district in promoting and protecting the interests of its employe members and in transacting business.

"(3) On or about June 28, 1954, Associated General Contractors of America, Inc., Georgia Branch, pursuant to the provisions of the Act, filed a charge with the Board alleging that respondent has engaged in, and is engaging in, unfair labor practices within the meaning of Section 8(b), subsection 4(A) of the Act.

"(4) Said charge was thereafter referred to petitioner as regional director of the Tenth Region of the Board for investigation and was investigated by petitioner and under his supervision.

"(5) There is and petitioner has reasonable cause to believe that:

(a) Campbell Coal Co. (herein called Campbell), a Georgia corporation, is engaged at Atlanta, Ga., in the wholesale and retail distribution of building materials, including ready-mix concrete. During the past year, Campbell purchased and caused to be shipped to its establishments at Atlanta, Ga., directly from points and places outside the State of Georgia, building materials and related products valued at in excess of $1,000,000. During the same period, Campbell sold and shipped from its establishments in Atlanta, directly to points and places outside the State of Georgia, building materials and related products valued at in excess of $50,000.

"(b) Campbell maintains two plants in the Atlanta area where it manufactures ready-mix concrete. The ready-mix is delivered by Campbell from said plants to various construction projects in and about Atlanta in Campbell's trucks operated by Campbell's drivers. These drivers make numerous trips to and from Campbell's ready-mix plants each working day.

"(c) Since on or about June 9, 1954, respondent has been on strike against Campbell and has picketed Campbell's two ready-mix establishments in the Atlanta area.

"(d) Since on or about June 9, 1954, respondent has caused one or more of its pickets to follow Campbell's trucks from its struck ready-mix plants to the site of various construction projects in the Atlanta area where Campbell's drivers were to make deliveries of ready-mix to a contractor who was a Campbell customer. At the construction project respondent's picket would ask the contractor, or his representative, not to accept the delivery of ready-mix from Campbell. In many instances such delivery was refused, and in those cases respondent took no further action. In instances where the contractor elected to accept delivery of ready-mix from Campbell, respondent picketed that contractor's building site with banners reading:

" 'Employes of Campbell Coal Co. on strike in protest of discharges against union employes. Sales Drivers, Helpers and Building Construction Drivers, Local 859, AFL.'

"Such picketing continued as long as Campbell's trucks remained at the contractor's job site.

"(e) In some instances the picketing described in the preceding subparagraph caused employes working on the picketed construction project to suspend work for the duration of the picketing. Respondent's pickets in no way informed the employes who suspended work as aforesaid, that the picketing was not intended as an appeal to them not to work, nor otherwise informed such employes that they were free to resume work while the picketing was in progress.

"(f) Among the contractors in the Atlanta area to whose construction projects Campbell delivers ready-mix and whose projects were picketed under the circumstances stated in subparagraph 5(d) above, are George A. Fuller Construction Co. (herein called Fuller), Southeastern Construction Co. (herein called Southeastern), The Flagler Co., Inc. (herein called Flagler), Barge-Thompson Co. (herein called Barge), Ira H. Hardin Co. (herein called Hardin), Wesley and Co., Inc. (herein called Wesley), Thompson and Street Co. (herein called Thompson).

"(g) At no time material herein has respondent had any labor dispute with Fuller, Southeastern, Flagler, Barge, Hardin, Wesley or Thompson.

"(h) Respondent's picketing of the construction sites as set forth in findings of fact 5(d), (e), (f) and (g)

(Continued on page 105)

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Use the coupon below for a demonstration, right at your own quarry, of King Detonite's cost-cutting ability. When you blast with Detonite, you get important reductions in four major operating costs:

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SHOW ME how DETONITE will cut my costs 4 ways. Without obligation, have the King Representative get in touch with me to arrange for a DETONITE demonstration right at our quarry.

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THE KING POWDER CO., INC.
CINCINNATI 1, OHIO
Since 1878—Our 76th year

PEOPLE

IN THE NEWS

Plant Manager Retires

PAUL KIRKBRIDE has retired as plant manager of the Independence, Kan., plant of Universal Atlas Cement Co., New York, N. Y., after 35 years of service. J. Palmer Camm, plant manager of the Fairborn, Ohio, plant since 1945, has been appointed to succeed Mr. Kirkbride. Thomas J. Griffeth, assistant plant manager at Fairborn, becomes plant manager, succeeding Mr. Camm, and James E. Jenks, project engineer at Fairborn, has been named assistant plant manager.

A native of St. Augustine, Fla., Mr. Kirkbride joined the Northampton, Penn., plant in 1919 as engineer and assistant maintenance superintendent. In 1924 he was transferred to the Hannibal, Mo., plant as assistant general superintendent, remaining there until 1943 when he became assistant manager of the Independence plant. Two years later he was appointed manager of the plant.

Mr. Camm was born in Fairton, N. J., and joined the company in 1925 as draftsman and surveyor at the Northampton plant. In 1926 he was transferred to the Watonga, Okla., gypsum plant as assistant foreman and later became superintendent. In 1936 he was transferred to the Leeds, Ala., plant as assistant manager, and was appointed plant manager in 1942. Three years later he became plant manager at the Fairborn, Ohio, plant.

Mr. Griffeth was born in Hannibal, Mo., and graduated from the Missouri School of Mines, Rolla, Mo., in 1940, with a B.S. degree in mechanical engineering. He joined the Hannibal plant in 1945 as maintenance engineer and supervisor of safety and personnel. He was appointed assistant plant manager of the Fairborn, Ohio, plant in 1950, which position he has held until his present appointment.

J. Palmer Camm

Thomas J. Griffeth

Mr. Jenks, a native of Bristow, Okla., joined Universal Atlas as engineer trainee in 1948 at the Fairborn plant, after which he was made process engineer. In 1954, he was promoted to project engineer at Fairborn, and has held this position until the present time. He was graduated from the University of Texas, Austin, Texas, in 1948 with a degree in mechanical engineering.

Expands Activities

ARTHUR R. ALVIS, owner of the Arthur R. Alvis Limestone and Concrete Products Co., Butler, Mo., in less than ten years has built up one of the most efficient crushed stone businesses in southwestern Missouri. This phenomenal growth was pointed out in an extensive story in the *Butler (Mo.) Democrat*. Arnold Edwards is general superintendent of the firm, and Marion Skinner manages the concrete block plant which was added a little over a year ago. Mr. Alvis' first plant was in West Plains, Mo., but a year later he moved to Butler, where his offices are today. He has since established plants in Nevada and Stotesbury, Mo. Prior to entering the crushed stone industry, Mr. Alvis was associated with the Universal Engineering Corp., Cedar Rapids, Iowa, and later became a used construction equipment dealer, which perhaps accounts for the fact that all of his crushing plants are Universal.

The crushed stone business is not the only interest of Mr. Alvis. An enthusiastic sports fan, particularly football and basketball, he is also very active in church and community affairs.

Heads Concrete Branch

JAMES M. POLATTY has been named chief of the concrete branch of the concrete division of the Jackson, Miss., sub-office of the Waterways Experiment Station, Corps of Engineers, Vicksburg, Miss. Born in Columbia, S. C., he has a degree in civil engineering from the University of South Carolina, Columbia, S. C. He has been engaged in testing and construction work since 1937 and has been with the Corps of Engineers since 1941. He has served as engineer-in-charge of the Mobile district Corps of Engineers testing laboratory; engineer on the Santee-Cooper Project near Charleston, S. C.; and concrete engineer at Allatoona Dam at Cartersville, Ga. Previous to his appointment Mr. Polatty was resident engineer at Jim Woodruff Dam near Chattahoochee,

James M. Polatty

Fla. He is a member of the American Concrete Institute and the American Society of Civil Engineers.

N.L.A. Guest

AMONG GUESTS at the Operating Division meeting of the National Lime Association in Milwaukee, Wis., were Arnold Lange, Hohenlimburger Kalkwerke, Hohenlimburg, Germany, and Hermann Holland, F. Schwenk, Nach F., Herrlingen, Germany, sons of leading German lime manufacturers. The two boys arrived in the United States, May 25, and returned to Germany, October 11, where they are enrolling in school to study courses on the nonmetallic minerals industries. A requirement for entrance to the course was a period of six months' work in such industries, and they gained considerable of that work experience in the United States.

Herman Holland of Herrlingen, Germany, left, and **Arnold Lange,** Hohenlimburg, Germany, sons of two prominent lime producers in Germany, were guests of the association

They put in from one to three weeks' work in six lime plants where American manufacturers provided paid employment. They worked in the quarries, drove trucks, trimmed lime kilns and did all manner of work, much of which was hard labor. It was the concensus of participating companies that they really were diligent and performed their jobs well. They, of course, had an opportunity to become familiar with United States practices in lime production, and prepared thorough reports on their work and observations. These reports, signed by their separate employers, were to be submitted to school officials.

Service Director Retires

J. GLENN BRAGG has retired as director of technical service, Alpha Portland Cement Co., Easton, Penn., after more than 27 years of service. He joined the company in 1927 as service engineer in the sales department and since then has served as eastern sales manager, general sales manager, assistant to the president and director of technical service. Previously he was with the U. S. Geological Survey in St. Louis, Mo., the U. S. Bureau of Mines in Pittsburgh, Penn., and the New Jersey State Highway Department in Trenton, N. J., as engineer of tests. A. T. Hersey, field engineer for the Chicago, St. Louis and Ironton, Ohio, sales districts, has been named to succeed Mr. Bragg as director of technical service. A graduate in civil engineering from the University of Illinois, Mr. Hersey was with the Illinois Highway Department before becoming associated with Alpha Portland Cement Co.

Named Vice-President

GEORGE L. CURTIS, chief engineer for United Concrete Pipe Corp., Baldwin Park, Calif., has been appointed vice-president of engineering, according to an announcement by Lloyd Earl, president. A graduate of Newark College of Engineering in New Jersey, Mr. Curtis joined the firm in 1946 after service during the war with the Civil Engineering Corps, U. S. Navy. He is a member of the American Sosiety of Civil Engineers.

80 Years Young!

O. S. STULL, president of the Liberty Limestone Corp., Buchanan, Va., was honored recently at a company picnic in celebration of his 80th birthday. Born in Richpatch, Va., in 1874, where he spent his early years, Mr. Stull was graduated in 1896 from Virginia Agriculture and Mechanical College, Blacksburg, Va., now known as Virginia Polytechnical Institute. One year later he became chemist for blast furnaces at Longdale, Iron Gate and Goshen, Va., and for a pipe foundry at Bessemer, Ala. In 1902 he became superintendent of a blast furnace at Shenandoah and for the next 29 years served in a similar capacity at Buena Vista, Goshen, Iron Gate, Roanoke and Pulaski. In 1931 he joined the Liberty Limestone Corp. as vice-president and sales manager, and has served as its president since 1936. In 1950, Mr. and Mrs. Stull celebrated their golden wedding anniversary.

O. S. Stull

Assists President

MORGAN MCCALL has been appointed assistant to Ralph B. Rogers, president of Texas Industries, Inc., Dallas, Texas. For the last five years he has been vice-president and general manager of Dunham Wilson Co., Inc., steel fabricators in Baton Rouge, La. A graduate of Louisiana State University and the Command and General Staff School at Fort Leavenworth, Kan., Mr. McCall served during the war with the Air Transport Command in Europe.

Morgan McCall

Assists Vice-President

VICTOR E. COLE has been appointed assistant to Claude E. Harper, vice-president and general manager of Kaiser Gypsum Co., Oakland, Calif. Mr. Cole was formerly assistant operating manager. He has been with the firm since 1941 and with the gypsum division for the past year.

Assistant Sales Manager

JOHN N. BRADFORD has been appointed assistant southern sales manager of the Birmingham, Ala., office of Alpha Portland Cement Co., Easton, Penn. Formerly special sales representative at Birmingham, Mr. Bradford succeeds H. Vernon Fitz, who passed away May 27.

Sales Supervisors

H. M. SHOLOTA, formerly sales engineer of the Chicago industrial district of United States Gypsum Co.,

Chicago, Ill., has been appointed sales supervisor of the Eastern industrial district. R. L. Kammer has been named supervisor of sales of the Southwestern district, and K. L. Michel has been made sales supervisor of the Southeastern district.

OBITUARIES

BASIL GORDON TAYLOR, president of the Earley Studio Corp., Rosslyn, Va., an architectural mosaic concrete firm, died August 28. He was 75 years old. Born in Greenwich, Va., Mr. Taylor moved to Washington, D. C., in 1900, where he entered into the mosaic concrete business with the late John J. Earley. For the last 25 years the business has been in Rosslyn. Mr. Taylor's firm produced many unusual pieces of mosaic work. One of the most unusual was the Bahái Temple in Wilmette, Ill., a suburb of Chicago, which took 19 years to complete. His firm also did mosaic work at the Mohammedan Mosque in Washington, D. C., as well as mosaic ceilings at the Justice Department, the Scottish Rite Temple and Sacred Heart Church. Five-ton mosaic concrete maps in the Memorial Chapel of St. James Cemetery in France, where more than 4000 American soldiers are buried, was also the work of his firm. The maps depict the movements of the allied armies from the beaches of France to the end of the World War II.

J. BRYAN OLDHAM, vice-president and general manager of the Texas division of Lone Star Cement Corp., New York, N. Y., died suddenly on October 5 at his home in Dallas. He was 58 years old. Born in Fulton, Ky., Mr. Oldham moved to Dallas in 1909 and was graduated from the University of Texas, Austin, Texas, in 1921 with a degree in civil engineering. He joined the Portland Cement Association as field engineer and later transferred to the sales department. In 1942, he was appointed general sales manager of Lone Star Cement Corp., New York, N. Y., and three years later became vice-president and general manager of the Texas division of the company. Mr. Oldham was a member of the Texas Manufacturers Association and the American Society of Civil Engineers.

LANSING SADLER WELLS, chief of the lime and gypsum section of the National Bureau of Standards, Washington, D. C., and an authority on the chemistry of lime, died August 8. He had been associated with the Bureau since 1924. He was author of numerous papers on cement, lime and gypsum, and in 1946 had patented a method of extracting aluminum from clay. Mr. Wells had been a member of the American Society for Testing Materials since 1930, serving as chairman of Committee C-11 on Gypsum from 1937 to 1953, and as chairman of Committee C-2 on Magnesium Oxychloride and Magnesium Oxysulfate Cements from 1947 to 1953.

JOHN H. BAKER, chairman of the board of the Standard Lime and Stone Co., Baltimore, Md., died August 27 at the age of 84. He served as president of the company from 1921 to 1944, when he retired as president and assumed the chairmanship. Mr. Baker was a son of the late John H. Baker, who with two of his brothers, Joseph and Daniel Baker, founded the company. Daniel Baker, Jr., is now president of the company. A native of Buckeystown, Md., Mr. Baker was also vice-president of the Citizens National Bank of Frederick, and a member of the board of Trustees of the Western Maryland College and the Westminster Theological Seminary.

WALDEMAR F. STUEWE, retired president of the Central Ready Mixed Concrete Co., Milwaukee, Wis., died September 16, after a short illness. He was 67 years old. Born in Milwaukee, Wis., Mr. Stuewe was a pioneer in the ready-mixed concrete business. Prior to becoming president of the Central Ready Mixed Concrete Co., he was president and general manager of the Central Sand and Gravel Co. Previously he was president of the Badger Sand, Gravel and Concrete Block Co.

GEORGE EDWARD DICKINSON, assistant sales manager of Superior Portland Cement, Inc., Seattle, Wash., died suddenly on September 17. He was 73 years old. Born in Omaha, Neb., Mr. Dickinson was graduated as a mining engineer from Yale University. He moved to Seattle in 1896 and became a partner in the Pacific Engineering Co. before joining Superior Portland Cement in 1913. He was a director of the company for 21 years.

HAYWARD S. THOMPSON, treasurer of the Eastern Magnesia Talc Co., Inc., Burlington, Vt., died suddenly on September 19 at the age of 52. A native of New Haven, Conn., Mr. Thompson was graduated from Williams College, Williamstown, Mass., in 1924. He founded the General Underwriters, Inc., of Detroit, in 1931 and was chairman of the board of directors until 1953. Mr. Thompson was a World War II veteran, serving as a major in the Army Engineer Corps.

KARL B. FUCHS, retired engineer of the Bay Bridge, Ohio, plant of Medusa Portland Cement Co., Cleveland, Ohio, died September 21. He was 79 years old. Born in Austria, Mr. Fuchs was graduated from the Virnna Institute of Technology and served as a marine engineer in the Austrian navy. He came to the United States in 1903, went to Chicago and became an engineer in the power plant of the Metropolitan Elevated Railroad. From there he went to Sears-Roebuck & Co. as assistant chief engineer and then into business for himself. He joined the Bay Bridge plant of Medusa Portland Cement Co. in 1907.

GEORGE W. JOHN, vice-president and general manager of the Petoskey Portland Cement Co., Petoskey, Mich., died September 7, after a long illness. He was 59 years old. Born in Raven Run, Penn., Mr. John moved to Petoskey in 1920. He joined the Petoskey Portland Cement Co. plant, which had just been built by his father, Jonathan B. John, and served as foreman and later superintendent. Mr. John attended the University of Pennsylvania, Philadelphia, Penn., and the University of Michigan, Ann Arbor, Mich. At the time of his death he was a director of the cement company, the Petoskey Transportation Co. and the First State Bank of Petoskey.

FRANCIS G. MCCARTHY, a partner in R. E. McCarthy & Sons, sand and gravel producers of Syracuse, N. Y., died October 4. Mr. McCarthy was a member of the Empire State Sand, Gravel and Ready Mix Association and a director of the Allied Transportation Association.

BARNEY O. NORD, superintendent of the Bessemer, Penn., cement plant of The Bessemer Limestone and Cement Co., Youngstown, Ohio, died at his home on August 27, after a short illness. He was 49 years of age. Prior to his appointment as superintendent, Mr. Nord was chief chemist at the plant.

OTHO M. GRAVES, chairman of the board of The General Crushed Stone Co., Easton, Penn., died October 15. He was 72 years old. Further details regarding Mr. Graves will appear in an obituary notice in the next issue of ROCK PRODUCTS.

ARCHIE ANDERSON, who was instrumental in organizing the Ohio Ready Mixed Concrete Association in 1938, died September 17. He was associated with the Anderson Haulage Co., Columbus, Ohio, and was active for many years on the Association's board of directors.

DEAN LOWRY, assistant superintendent of the Monolith, Calif., plant of Monolith Portland Cement Co., Los Angeles, Calif., was killed September 25 when the car in which he was riding missed a curve and overturned on Oak Creek Road near Tahachapi, Calif.

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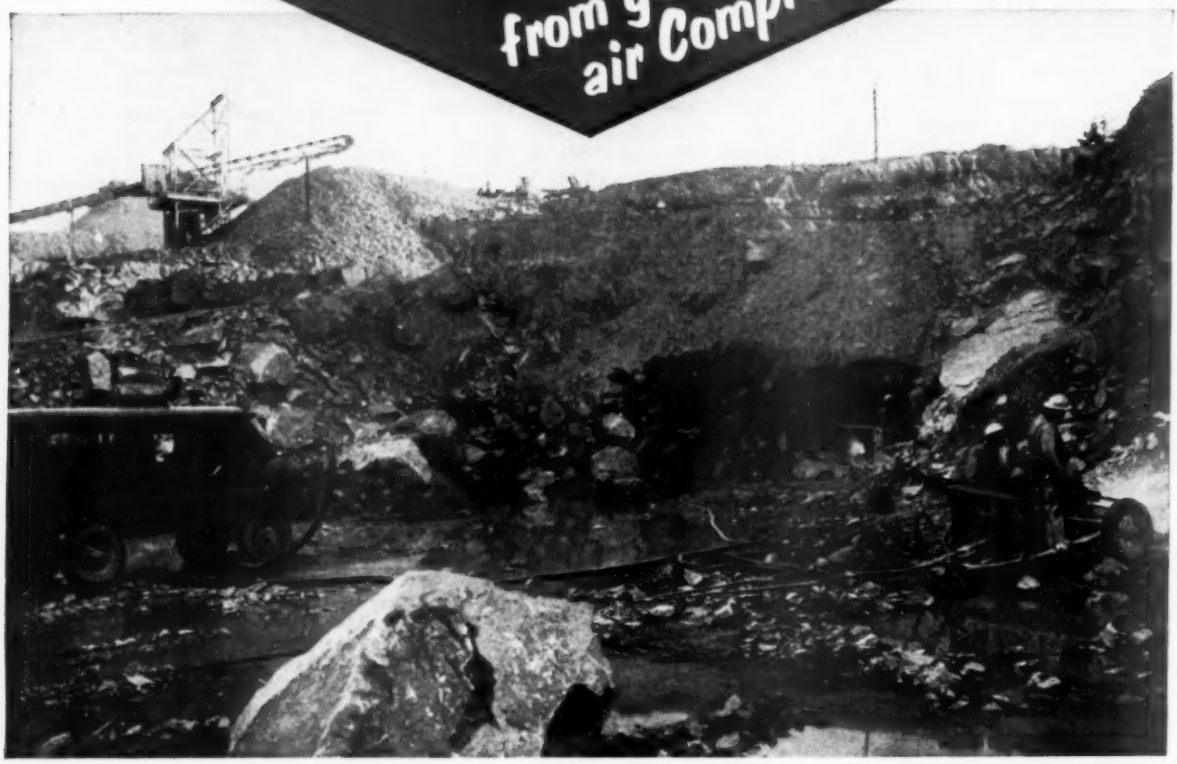

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INDUSTRY NEWS

Cover Picture

THIS MONTH'S COVER illustration shows the dredging operation of Dakota Sand and Gravel Co., used to strip heavy overburden, ranging up to nearly 60 ft. In the background may be seen the 123-ft. steel mast, cables and slackline cableway excavator bucket which will reclaim the sand and gravel deposit below 20 to 25 ft. of water. The gravel deposit ranges from 65 to 85 ft. in depth. The dredge has a 45 ft. Eagle Iron Works digging ladder equipped with a Swintek cutter.

Honors First Talc Plant

ROBERT H. MCCARTHY, president, International Talc Co., Inc., Gouvernor, N. Y., recently dedicated a large bronze plaque memorial to the first talc plant in the United States, in ceremonies at the approximate site of the plant, on Route 58, between Fowler and Balmat, N. Y.

Erected by International Talc Co. and the town of Fowler, the plaque states that "near this point was erected the first mill in the United States to grind talc on a commercial basis." It was built by Agalite Fibre Co. in 1876. The plant was operated by steam, with a capacity of 8 tons per day.

Roofing Granule Plant

MINNESOTA MINING & MANUFACTURING CO., St. Paul, Minn., has opened its new roofing granule plant at Wausau, Wis. The company began the manufacture of ceramically-coated roofing granules in the early 1930's, and is now one of the country's leading producers. It is estimated that 85 percent of American homes have granule-coated asphalt roofs, compared with 10 to 15 percent 20 years ago.

Canadian Cement Expansion

CANADA CEMENT CO., LTD., Montreal, Que., has started construction of a $1,000,000 portland cement clinker-grinding plant at Edmonton. The plant will use material from the company's Exshaw, Alta., unit, and will grind, package and store cement for use in the Edmonton area. It is scheduled for completion in early 1955. The company is spending approximately $10,000,000 this year on its plant expansion and improvement program, of which the biggest outlay is for the doubling of the capacity of its Fort Whyte, Man., plant. By early 1955, the company reportedly will have an annual cement producing capacity of 19.1 million bbl., which is a 91 percent increase from 1945.

Presents Gift to Warm Springs Foundation

NEW YORK TRAP ROCK CORP., New York, N. Y., recently presented a 550-lb. polished stone, complete with inscription, to the Warm Springs Foundation. The presentation was made at a short informal ceremony at Stoneco, near Poughkeepsie, N. Y., by Wilson P. Foss, III, president of Trap Rock, and was accepted by Mrs. Franklin D. Roosevelt and Charles F. Palmer of Warm Springs, Ga.

The highly polished stone, which was quarried at Stoneco, 12 miles south of the former president's resting place at Hyde Park, is a piece of native dolomite, 25 x 35 x 6 in. It contains an illustration, etched into the stone, of New York State with the cities of Albany and Hyde Park. The inscription reads: "Quarried at Stoneco, 12 miles south of birthplace of Franklin Delano Roosevelt." The stone has been shipped to Warm Springs where it will be set in a panel of stone mementos which have come from every state in the union.

In the short ceremony, which was attended by many Trap Rock employes and executives, Mr. Foss stated that the stone was a gift of appreciation from the workers of the plant, from the people of Poughkeepsie and from the people of the State of New York to the Warm Springs Foundation for its early and great fight against the scourge of polio.

In accepting the stone for the Warm Springs Foundation, Mr. Palmer said: "Thanks to you who have made this memorable presentation, tens of thousands from all over the world will view your gift. F.D.R. would like what you have done."

Mrs. Roosevelt, in alluding to the stone: "This is a little bit of Dutchess County, which he always loved, being sent to Meriweather County, Ga., which he loved equally as well. One of the reasons he loved Warm Springs so much was the strength it seemed to give him, and the inspiration it afforded, when he watched the great work that was done so long ago in the gallant fight against polio."

Left to right: H. B. Johnson, city manager, Poughkeepsie, N. Y.; Floyd J. Buffington and Gerald P. Boyle, vice-presidents, New York Trap Rock Corp.; Mrs. Roosevelt; Charles F. Palmer, Warm Springs, Ga.; and Wilson P. Foss, III, president, New York Trap Rock Corp., who presented the gift of the 550-lb. inscribed stone shown in foreground

Ilmenite Plant

E. I. DUPONT DE NEMOURS' new ilmenite "floating" plant at Lawtey, Fla., is scheduled for completion in early January, 1955. The plant, which will cost an estimated $3,000,000, will dredge and process ilmenite sand at the rate of 100,000 tons per year. The Lawtey plant, like its twin, the Train Ridge plant, near Starke, Fla., will be operated for duPont by Humphreys Gold Corp. The ilmenite sand will be shipped to duPont's Wilmington, Del., plants for further processing.

The plant is the third of its kind in Florida, another being operated by Humphreys Gold Corp., on its own property in Duval County. Reports of recent discoveries of ilmenite sand deposits in Florida indicate the possibilities of further plant developments.

In charge of the Bradford County ilmenite operations for Humphreys is E. C. Wichel, Jr. Over-all director of Humphrey's Florida operations, including the Duval County plant, is J. P. Wood, vice-president.

Opens New Crushing Plant

SAN JUAN GRAVEL PRODUCTS CO., Farmington, N. M., recently announced the opening of its second large gravel crushing and screening plant, said to be the largest and most modern in the San Juan Basin. The plant is electrically controlled and said to be capable of producing nine different sizes of aggregates simultaneously. Capacity output is 250 t.p.h. A 10-in. main from the plant's reservoir furnishes 1000 g.p.m. of water for washing. A combination of roll and jaw crushers handles oversize aggregate.

The company also owns and operates a ready-mixed concrete plant, known as the South Behrend plant. Plant capacity is 75 cu. yd. of concrete per hour. Its fleet of ready-mixed concrete delivery trucks are equipped with field radio phones. General manager of the company is Claude Adams; plant superintendent is Floyd Gordanier; and crusher construction superintendent is Roy M. Pearson.

Mexican Cement Production

MEXICAN CEMENT PRODUCTION is expected to amount to about 1,671,600 tons, valued at 215 million pesos (about $17,200,000), according to the Mexican National Chamber. This is about the same as the 1953 production. Plant capacity of the Mexican cement industry is reported at 2,500,000 tons. The National Chamber reported that although a number of foreign countries had sought to purchase Mexican cement, these potential orders had to be refused for lack of a national merchant marine. With shipping costs on foreign lines high, the republic cannot compete in foreign markets.

Announcement was also made of a new cement plant to be built at Tecoman, in the state of Colima, with financing to be supplied by Mexican capital. The plant, which will have a 250-ton daily capacity, will supply local needs in Colima, Jalisco and Michocan.

Asbestos Project Underway

UNITED ASBESTOS CORP., LTD., Montreal, Que., has announced that physical work is well underway on the $20,000,000 program of bringing into production the asbestos ore bodies underlying Black Lake, Que. An agreement has been finalized between United Asbestos and American Smelting and Refining Co., under which Lake Asbestos of Quebec, Ltd., a subsidiary of the latter company, will provide the capital to bring the asbestos deposits into production and, thereafter, manage and operate the mine.

This large mining-engineering project involves the draining of Black Lake, diversion of the Becancour River, construction of dams, spillways and drainage channels, creation of one of the world's largest open pits for asbestos mining, and installation of a plant capable of handling 1,500,000 tons of ore annually. In terms of fiber production, it is estimated that the new property, at its projected milling rate, will produce upwards of 100,000 tons of fiber annually.

Dredging Facilities Expanded

DREDGING OYSTER SHELLS from the bottom of the San Francisco Bay is an important phase in the production of cement at Ideal Cement Co.'s Redwood City, Calif., plant. Two oyster-shell dredges and a fleet of towboats and barges are used to keep the Redwood City plant supplied with the necessary shells for cement production. This marine equipment operates one, and sometimes two, 8-hr. shifts, six days a week, to maintain a sufficient stockpile of the shells. In all, Ideal's marine equipment for the operation includes two dredges, 14 barges, four towboats and one launch.

In a program of modernization of equipment, Ideal recently re-powered two of its four towboats, the "Pacific No. 1" and the Pacific No. 3," and the dredge "Texas," with Caterpillar diesel engines. The "Texas" is now powered with a D397 marine engine which drives a 15-in. Simon suction pump, and a D17000 diesel electric set used to generate the electrical power for operating the dredge equipment, including the cutter and winches. A 116-hp. gas auxiliary engine is used to operate the air compressor, and bilge

Spout of dredge "Texas" pours out oyster shells scraped from bottom of bay. Shells are hauled seven miles to Redwood City cement plant

Cutter blades on dredge scrape oyster shells from the bottom of San Francisco Bay for use in cement production at Ideal Cement Co.'s Redwood City, Calif., plant. A 15-in. suction pump is used

and fire pumps. The dredge is 104 ft. long, 32 ft. wide and has a 9-ft. draft.

The "Pacific No. 1" is now powered by a D397 engine which swings a 60- x 28½-in. Werkilla propeller through Falk 3:1 reduction gears. This boat is 55.7 ft. in length, has a 15.5-ft. beam and a 6.1-ft. draft. The "Pacific No. 3" is the most recent craft to be repowered and also has a D397 engine, but with a 3½:1 reduction gear. It is 60.1 ft. long with a 15-ft. beam and 7.2-ft. draft. The propeller is a 62- x 40-in. Pitchometer.

Portland Cement Production

THE PORTLAND CEMENT INDUSTRY produced 25,467,000 bbl. of finished cement in July, 1954, as reported by the Bureau of Mines. This was an increase of 6 percent compared with the output in July, 1953. Mill shipments totaled 27,628,000 bbl., 4 percent above the July, 1953 figure, while stocks were 9 percent lower than those on hand for the same month of 1953. Clinker production during July, 1954, amounted to 24,062,000 bbl. 4 percent more than in July, 1953. The output of finished cement during July, 1954, came from 157 plants located in 37 states and Puerto Rico. During the same period of 1953, 24,134,000 bbl. were produced in 156 plants.

Cement Import

ACCORDING TO THE PORT OF BOSTON COMMISSION, the Boston, Mass., port recently received its first foreign-produced cement in 20 years. The consignment, which totaled 235 tons, was imported from Belgium. The need for imported cement was said to be due to recent strikes at cement plants in Maine, upper New York State and Pennsylvania.

Pavement Yardage

AWARDS OF CONCRETE PAVEMENT for the month of September were listed by the Portland Cement Association as follows:

	Sq. yd. awarded during September, 1954
Roads	4,301,429
Streets & Alleys	2,313,538
Airports	1,205,667
Total	7,820,634

To Add Towboat

KANAWAH SAND CO., subsidiary of McDonough Construction Co., Parkersburg, W. Va., is adding a new 74-ft., 200-ton twin screw river towboat to its present facilities. The boat, which is being built at the yards of Hillman Barge and Construction Co., Pittsburgh, Penn., will be named "Cap'n Bill Stump," in honor of a former employe.

Power for the craft will be supplied by two 6-cylinder turbo-charged, heavy-duty engines, each rated at 300 hp. at 1200 r.p.m. Pumps for the hydraulic steering system will be driven by each engine. Reverse reduction gears will deliver 290 brake hp. on each propeller shaft. Pilot house controls are provided for operation of the keel-cooled pair of engines.

Cement Shares Sold

STOCKHOLDERS of Hercules Cement Corp., Philadelphia, Penn., have subscribed for 40,385 of the 40,555 shares of stock recently offered for subscription, as recently announced by D. S. MacBride, company president. The shares were offered at $25 a share on a one-for-four held basis. The unsubscribed shares were acquired by underwriters.

Florida Cement Consumption

FLORIDA'S construction industry consumed 7,487,367 bbl. of United States-produced portland cement in 1953, an increase of 12 percent from the 1952 consumption, compared with a national increase of 4 percent, as reported by the Florida State Chamber of Commerce. During the past five years, annual use of cement in Florida has increased 67 percent in the state. In 1952 (latest official figures available) the value of all types of private and public construction in Florida reportedly totaled $817,400,000, an increase of over 41 percent over that of five years previous.

First Lightweight Aggregate Plant in Indiana

MIDWEST AGGREGATES, INC., Brooklyn, Ind., is the name of a new company manufacturing lightweight aggregate, the first in Indiana. The plant is located about 20 miles southwest of Indianapolis. Shale is the raw material. Calcining equipment comprises two oil-fired 7- x 60-ft. rotary kilns. Initial capacity will be 350 cu. yd. of finished aggregate per day, but the plant layout is designed to permit substantial expansion of facilities to meet the requirements of the Indiana market. W. G. Brierley, Jr., general manager, is in charge of operations.

Coming Conventions

November 22-24, 1954—
National Concrete Masonry Association, 11th Annual Meeting of Southeastern Group, Soreno Hotel, St. Petersburg, Fla.

January 9-13, 1955—
National Ready Mixed Concrete Association, Silver Anniversary Convention, Miami, Fla.

January 9-13, 1955—
National Sand & Gravel Association, 39th Annual Convention, Miami, Fla.

January 10-13, 1955—
American Road Builders' Association, Annual Convention and Highway Materials and Supplies Exhibit, Roosevelt Hotel, New Orleans, La.

January 12-13, 1955—
Wisconsin Concrete Products Association, 35th Annual Convention, Plankinton Hotel, Milwaukee, Wis.

January 17-18, 1955—
National Agricultural Limestone Institute Inc., 10th Annual Convention, Hotel Statler, Washington, D. C. Executive Committee, January 15, Board Meeting, January 16.

January 24-27, 1955—
National Concrete Masonry Association, Convention and Exposition, Cleveland, Auditorium, Cleveland, Ohio.

February 7-9, 1955—
National Crushed Stone Association, 38th Annual Convention, Netherland Plaza Hotel, Cincinnati, Ohio.

February 21-24, 1955—
American Concrete Institute, 51st Annual Convention, Hotel Schroeder, Milwaukee, Wis.

HINTS AND HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN

Efficient derrick on top of sand and gravel plant handles repair parts and other construction work

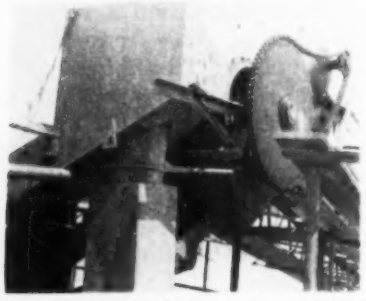
Rugged Derrick

MANY DERRICK-HOISTS seen in rock products plants are make-shift affairs; some power-driven but many still using hand-operated winches. The derrick shown in the illustration is of rugged construction, is neat, and has some interesting operating features. The derrick is located on the top deck of a southern sand and gravel plant.

Three motors are used; a swing motor, a hoist motor and a boom motor, with each motor delivering power through a right-angle gear-reduction unit. The derrick is rugged enough to lift practically any repair part or structural steel that may be used in the upper section of most sand and gravel plants.

Two-Way Chute

IN THE ILLUSTRATION may be seen the roller chain assembly which drives the belt conveyor emerging from a surge pile. The chute at the left, delivers the gravel from the belt conveyor to the vibrating screen section of the plant. Should it become desirable to by-pass the screens and load material direct from the surge pile, the vertical pipe section under the chute can be used. Enough gravel is retained in the pocket formed by the gate above the pipe to act as a cushion or "rock box" and thereby reduce chute wear.



Chute with vertical pipe section and gate below to by-pass screens

Safety Tips on Electrical Maintenance

IN THE "HINTS AND HELPS" SECTION of the May issue of ROCK PRODUCTS was an item showing a lockout scheme for holding a stop button in the "off" position so that a motor cannot be started while electrical maintenance work is underway. An interested reader has pointed out that, while these measures are better than no protective features at all, such devices are not completely safe because they give a false sense of security. He made some comments and suggestions, based on study and experience at his company's plants. His suggestions, which other readers may find interesting and helpful, are, in part, as follows:

"All electrical manufacturers that furnish push button stations also can furnish lockouts for the stop button as an extra, and most of the push button stations we use incorporate this feature. We have found through bitter experience, however, that this lockout should be considered only as an operational device to indicate to an operator that he should not attempt to start the particular machine involved, not because of any safety question, but purely because the machine should not be run and, in this respect, the lockout serves its purpose.

"The stop button's sole function is to open the hold in coil control and it is possible for a ground or short to develop in the control wiring that will permit the effected motor to run even though it is supposed to be stopped. It is true that this rarely happens, but 'rarely' is too often where safety is involved.

"Many control circuits are wired with a poor grade of wire having a plastic insulation that does not stand up well, particularly where heat is involved, and our operators have seen motors start up by themselves, or have found that motors failed to stop when a stop button was pushed. Water may be the cause, and shorts or grounds may occur during or after a heavy rain. In view of this, it is considered imperative from a safety point of view that disconnect switches be opened and, where fuses are used, the fuses should be removed from a starter and the starter box locked out of service by the electricians or mechanics who are to work on the motor or machine requiring maintenance.

"Bicycle-type padlocks are very satisfactory for locking out starters. Several locks can be slid over the hairpin, the individual lock belonging to the electrician or repairman involved; in other words, if a machine is shut down and locked out, the electrician would first slip his padlock over the hairpin and then the repairman going into the machine would slip a second padlock over the hairpin and, as a further precaution, the shift foreman could slip a third padlock over the hairpin. This makes it impossible for a piece of machinery to be started until after all interested parties have removed their respective padlocks.

"There is quite a difference of opinion as to whether circuit breaker or fused-type disconnect switches are the best. From a safety point of view it is possible for a handle of a circuit breaker to break loose within the case and fail to open the circuit even though the switch appears to be open. Fuses, on the other hand, are considered the most foolproof because they can be removed entirely and, in fact, it is quite customary for an electrician or mechanic to place the fuses in his pocket while he is working on a machine that has been shut down for repairs."

Truck Bin Overflow Chute

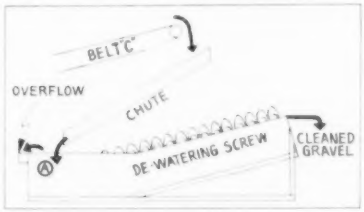
A WESTERN SAND AND GRAVEL PRODUCER has provided a truck-loading bin with an overflow spout. In the

Overflow chute from truck-loading bin prevents shut-down in operation

event the bin is filled by the belt conveyor, considerable material can be ground stored by means of the chute and thereby prevent a possible slowdown in the operation.

Removing Wood Chips

A WESTERN GRAVEL PRODUCER solved the problem of removing water-logged wood chips by introducing the sized gravel (with some crushed gravel) into an Eagle spiral dewatering unit so that the direction of travel of the aggregate is the same as the direction of the spiral unit's overflow. The belt conveyor delivers to a chute well over the spiral, and at this point the gravel reverses its direction of travel by means of a chute.



Sketch showing how de-watering screw functions to remove wood chips. Point "A" indicates where turbulence of gravel lifts out pieces of wood

The cascading gravel creates additional turbulence at the toe of the spiral (in the area marked "A" on the sketch) which is sufficient to lift the water-logged chips out of the unit.

Chute puts gravel (including wood chips) into dewatering unit in the same direction of travel as the water overflow. Note wheelbarrow full of chips

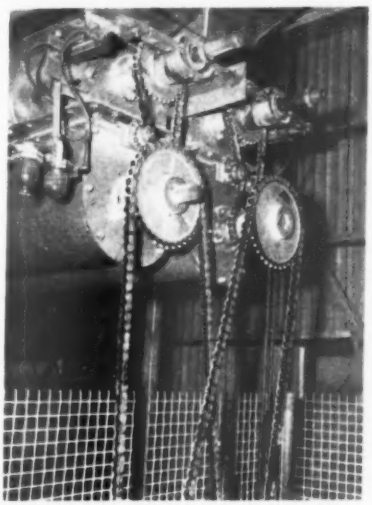
As the gravel has been through a crushing operation, the pieces of wood have had most of the water squeezed out of them which increases bouyancy.

There are two "de-wooders" in this operation with the overflow converging to a sump over which is a stationary screen where the wood is removed. Several wheel-barrow loads per day are often removed by the two units.

Cement Conveyor Drive

AN UNUSUAL CHAIN DRIVE for two parallel bulk cement conveyors and their respective rotary valves is shown in the illustration. On the floor below is mounted a "Hi-Lo" speed motor. The high speed motor delivers most of the cement to the weighing hopper, and the low speed unit takes care of the "dribble" feed. The "Hi-Lo" motor drives the two conveyors by means of a clutch and jack shaft.

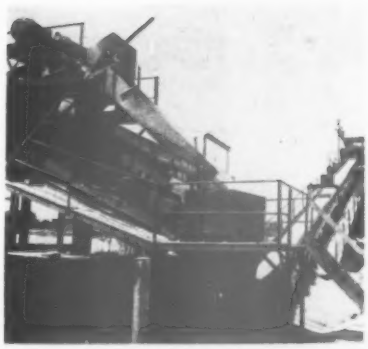
Roller chains are used throughout in this drive. Sprockets on the shafts of the conveyors drive the rotary valves with a third set of sprockets used as an interposed tightener.



Chain drives from motor on floor serve the two cement screws and their valves

Rinse Screen By-pass

WHERE COARSE AND FINE AGGREGATES both use the same reclaiming belt conveyor, it is necessary to have some type of by-pass for the sand if the coarser aggregates have to be rinsed before loading. The installation shown takes care of this problem by having a pivoted or hinged chute over the top of the screen when sand is being loaded. The screen is a 4- x 12-ft. Tyler unit. The loading belt conveyor, to the right, is equipped with a continuous weighing device.



Rinse screen installation. Arrow points to hinge or pivot

Testing Laboratory at Loading Point

AT A RELATIVELY NEW AND MODERN sand and gravel plant in the South, material is loaded to cars by a belt conveyor. Material from this belt can drop to a second belt conveyor which delivers to the truck-loading bins. At the top end of the first belt conveyor, the designers of the plant located a testing laboratory so that material can be sampled and tested as loaded.

Ample window area in the laboratory permits easy visual inspection of the material on the belt conveyor. The laboratory includes Rol-tap and Gilson laboratory screens. A Connecticut, 5-outlet, "Direct-Call" phone in the building affords quick inter-plant and office communication.

Laboratory is located at loading point, above track, for visual inspection of material on loading belt conveyor

NEW MACHINERY

Washing-Screening Plant

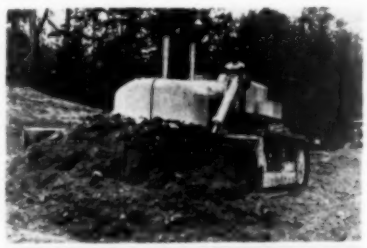
PIONEER ENGINEERING WORKS, INC., Minneapolis, Minn., recently announced a portable sand washing and screening plant, designated the 412-VW, with a total capacity of 100 to 150 t.p.h., producing two sizes, sand and coarse aggregate.

Three means are provided for controlling fines: regulation of water flow; adjustment of the overflow weir; and changing the baffle height. The plant is mounted on pneumatic tires and is equipped with air brakes controlled from the towing unit and manually from the operator's platform. The conveyors are supported on the plant and fold for travel, each being driven from the plant and controlled by a clutch from a lever on the operator's platform. The power unit is mounted over the rear equalizer.

The plant includes a reciprocating plate type feeder with a 6-ft. square hopper and trap grate; a 4- x 12-ft. two-deck, four-bearing, positive throw eccentric type vibrating screen; a 22-in. x 20-ft. twin screw Eagle dehydrator with a large settling tank, adjustable overflow weir and adjustable baffles; a 24-in. x 32-ft. feeder conveyor; 30-in. x 18-ft. sand delivery conveyor and; a 24-in. x 14-ft. oversize delivery conveyor. The power requirement is 60 hp., and a maximum of 700 gal. of water is required per min. at 50 p.s.i.

Rock Drill

DAVEY COMPRESSOR CO., Kent, Ohio, has announced the DS-58 medium weight rock drill for drilling both primary and secondary blast holes. Pneumatic pawls are used in the rotation ratchet, and are "pushed" out of engagement of the ratchet teeth at the time the ratchet starts to turn, thus eliminating wear on the pawls. The construction of the pawls is such that all four edges can be used before they are replaced. Other design features include involute splines, chrome-plated cylinder bores, and rocket valves with double trip ports for positive piston hammer action. The drill is available in four types; blower, blast, wet with manual water valve, and wet with auto-water valve. Each can be changed to any one of the other types without dismantling the drill. Three rotation speeds of fast, average and slow can be furnished. Raised center grip and raised tee handles are optional.



Twin Crawler Tractor

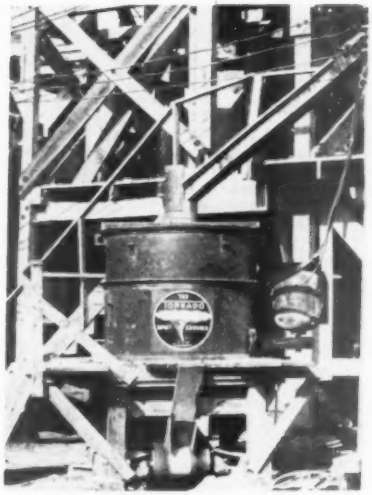
EUCLID DIVISION, GENERAL MOTORS CORP., Cleveland 17, Ohio announced its entry into the tractor market with a demonstration of the Model TC-12 twin engine crawler tractor of unusual design at the GM Proving Ground, Milford, Mich. About 400 were in attendance, including distributors from 20 nations and representatives of publications serving the construction, mining, and quarrying fields. The demonstration not only included the Model TC-12 in action, but all the other models of the Euclid line, including the new S-7 scraper and other models, rear-dump haulage units from 10 to 50 hp., bottom-dump units from 13 cu. yd. to 40 ton, and the new loader unit.

The Model TC-12 tractor, which is expected to go into production in the latter part of 1955, is powered by two 190 hp. General Motors 6 cyl. diesel engines, Model 6-71, each driving an Allison torque convertor and Allison Torqmatic transmission. Each drive train independently powers one track. The final drive gearing is the same planetary type used in the Euclid 50-ton dump trucks and 25 cu. yd. bottom-dump wagons. Two separate drive and track assemblies are free to oscillate on a 7-in. transverse shaft. It can even be separated for shipment where weight and width restrictions are encountered. The two-section design is also said to give flexibility over uneven ground, and the tracks maintain good traction because each half of the tractor maintains better ground contact in rough terrain. A free movement of 7 in. is limited by stops welded to each frame half. Some of the tractors will be field tested with rigid mounting on the cross shaft for applications where oscillation is not desirable.

The engines are mounted side-by-side, and drive through universal joints and drive shafts to the torque converter, which is located below and to the rear of the operator location. The converter, transmission, reduction gearing, and steering brake form one complete removable assembly. The reduction drive gears for each half of the tractor transmit power through an axle shaft to the sun pinion and the three-gear set of the planetary, located within the drive sprocket.

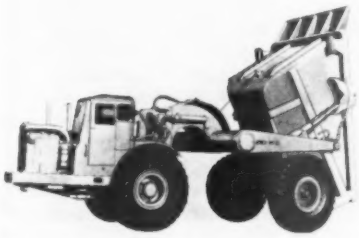
Steering can be accomplished in several ways. It can be steered by increasing or decreasing the speed of one engine for gradual, even change in direction; it can be steered by putting one transmission in neutral and applying a track brake; or sharp turns under full power can be made by putting one transmission in forward and the other transmission in reverse.

The tractor weighs 53,000 lb. without attachments, the travel speed is 0 to 8 m.p.h., with three speeds, and an electrical starting system is used. Overall length is 15 ft., overall width is 11 ft. 4 in., height is 8 ft., exclusive of exhaust stacks, and ground pressure is 8½ p.s.i.



Impact Crusher

ADAMS ENGINEERING CO., 500 Pennsylvania Ave., Matamoras, Penn., has announced the "Tornado" impact crusher, a centrifugal unit for fine reduction of small gravel, rock, ores, etc. It utilizes a "square" impact blow, and has reversible manganese impact plates and ferrous, wear-resistant, chromium impeller shoes. Each breaker plate is held by one hook-bolt, and the impeller shoes are fastened by hooks. Except for the space required for the V-belt tunnel, the entire bottom area is workable for the free discharge of crushed material. The crusher may be used in open or closed circuit as required. The 4-ft. unit handles up to 40 t.p.h. using 10 to 30 hp.; it has a 5-in. circular feed pipe, and operates from 1200 to 1600 r.p.m., with velocities up to 12,000 f.p.m.

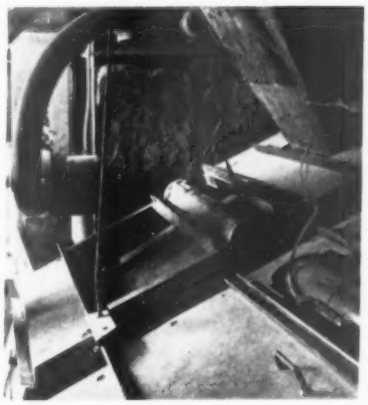


Tractor-Trailer

ATHEY PRODUCTS CORP., 5641 West 65th St., Chicago 38, Ill., has announced the Athey PR21 rear-dump trailer, for use with the Caterpillar DW 21 tractor. The team can haul 31 tons or 22.5 heaped cu. yd. at speeds up to 20 m.p.h. The trailer features a wide, open-mouthed body with a low overall loading height, averaging 9 ft. 5 in. and 6 ft. ½ in. at the rear. A shield extends across the body to protect the tractor and operator. The body is constructed of ⅝-in. high-strength steel and has a sandwich bottom with ¾-in. armor-plate as the top layer, heavy oak planking filler, and a ⅜-in. bottom plate. The axle members are of structural steel and the axles bolt into place. The trailer tread is 115 in. to provide additional stability for high-speed hauling.

The tractor has a constant mesh transmission with five gears, ranging from 2.16 to 20 m.p.h. The tires and wheels of the tractor and trailer are interchangeable. A 6-cylinder Caterpillar diesel engine powers the tractor, and produces 225 hp. at 1900 r.p.m. The unit steers hydraulically with two double-acting pistons pivoting the tractor 90 deg. in either direction. This provides a low turning radius of 16 ft. 9 in. with the body down or 13 ft. 5 in. with the body up. The 22- x 7-in. brakes on all wheels can be applied individually on each unit or simultaneously.

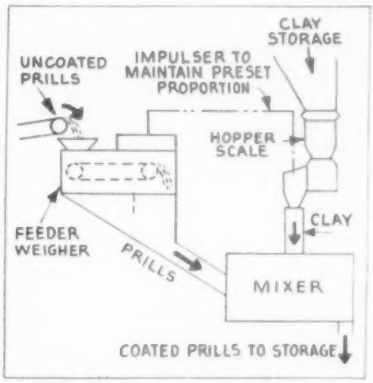
Three-stage hydraulic hoists on the trailer lift the body to a 60-deg. angle to spill the load. A hydraulic unit mounted on the rear of the tractor supplies the hoisting power. The trailer is interchangeable with the Caterpillar No. 21 scraper.



Eccentric Motor Screen

FRONTIER BRONZE CORP., 4870 Packard Rd., Niagara Falls, N. Y., has announced the use of Frontier 40-E aluminum alloy for Derrick eccentric motor screens, manufactured by Derrick Manufacturing Co. of Buffalo, N. Y. The motor screens, for screening fine materials either wet or dry, are available in a screening range from 2 to 425 mesh. The use of the 40-E aluminum alloy for the long, tubular motor housing is said to reduce the weight to 145 lb., thus permitting higher amplitudes of vibration, and thereby increasing the capacity by approximately 30 percent. The alloy housing permits the motor to run cooler by transmitting the heat over the entire housing surface. It is also said to be shock resistant and have a high yield strength. The natural color of the aluminum casting eliminates the necessity of painting or finishing. The casting is claimed to retain its natural color due to its resistance to the action of corrosive atmospheres and liquids either in the unstressed or stressed condition.

The above illustration shows the eccentric motor screen with a motor housing of aluminum alloy to the left, installed alongside an earlier steel housing model at a limestone plant.

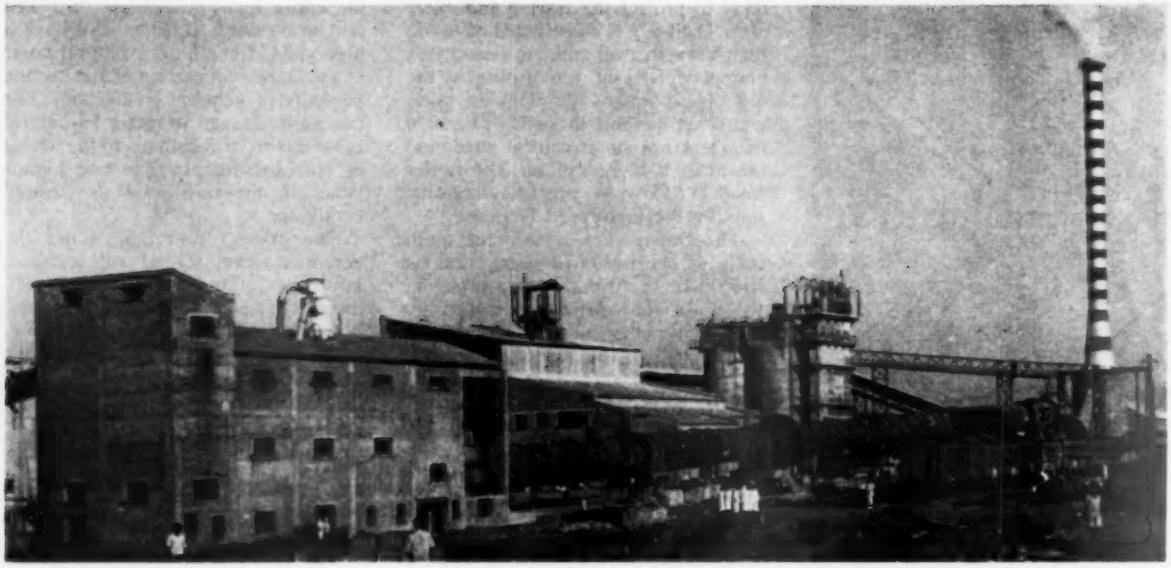


Remote Weight-Control

RICHARDSON SCALE CO., Clifton, N. J., has introduced a remote weight-control system for continuously and accurately blending additives with process material. It features batch weighing of additives, continuous weighing of process material and the remote selection of weight ratios, using a single dial control. Components of the system include an automatic hopper scale, electric control system, control panel and a constant-weight belt feeder. In operation, the process material drops on the belt feeder and discharges into a mixer. Additive batches are weighed out and automatically discharged into the same mixer. The flow of material leaving the belt feeder determines the rate of discharge of additive material; an impulser mounted on the belt feeder transmits a signal for the discharge of additives. The system handles such products as chemicals, fertilizers, plastics, cement and rock products.

Motor Base

T. B. WOOD'S SONS CO., Chambersburg, Penn., has brought out a "Quick-Slide" motor base featuring an adjusting screw which may be released to permit the motor to be moved freely after the base is bolted down. The base is designed especially for wide-range, variable-pitch sheave installations which require provision for more take-up than standard V-drives.



Wet process cement plant has 475-ft. kiln with two sections at the ends of 11 ft. 10-in. dia. and a center section of 10 ft. 10-in. dia.

India Increasing Cement Capacity To Keep Up With Construction Needs

• Orissa Cement Ltd., Rajganpur, India is operating a new plant with a production of 500 tons per day. New mill to supply 400,000 tons for Hira Kud Dam and other projects in the government's Five-Year Plan

By JOHN GRINDROD

WITH THE EXTREME RAPID INDUSTRIAL DEVELOPMENT of India during the past decade, one of her greatest needs has been cement for the construction of new factories, new dwellings and new dams for hydroelectric projects. The fillip given by the war to India's industries was followed by the enormous incentive of achieving self-government and many new projects are in hand. These are included in an overall Five-Year Plan, approved by Parliament in December, 1952, covering the years 1951-1956.

Because of the great need for cement in construction, the progress in adding cement production has, in some respects, been more striking than that of other industries. In 1947, total production was 1,447,200 tons; in 1951 it was 3,195,600 tons and from January to June, 1952, 1,680,500 tons were produced. Present production is said to be running at an annual rate of 4,000,000 tons.

At present the manufacture of cement is in private hands, though, under the Five-Year Plan, a U. P. Government cement mill is expected to be completed in the period 1953-1954 that will have a capacity of 200,000 tons a year, and which, it is estimated, will cost $4,852,600. Private production is expected to reach 4,515,000 tons annually by 1956.

One of the most recent contributors to increased cement production in India has been the new cement plant of Orissa Cement, Limited. Officially opened in 1952, it is regarded as a development of prime importance. Linked up with the Hira Kud Dam Project, one of the major projects in India today, for which it will supply an estimated 400,000 tons of cement, it will help to harness the wild and turbulent Mahanadi River for the ultimate irrigation of over one million acres of land and for the generation of 350,000 kw. of electrical energy. Furthermore, it will help to augment the nation's vital cement resources at a time when India is badly in need of this commodity.

Built in a period of 18 months, which is claimed to be a record for the construction of a mill of this size, the plant has a rated capacity of 500 tons of cement per day. Machinery installed in the factory was supplied by F. L. Smidth & Co., Ltd.

It was the abundance of limestone deposits in the vicinity of the Hira Kud project which gave birth to the idea of erecting a cement mill nearby which would ensure a continuous supply and would cut transport costs. On the completion of the scheme, the cement thereafter produced would become available for other domestic purposes and for export. The site chosen by Orrissa Cement Ltd., which was formed by Messrs. Dalmia Jain with the aid of the State Government, was at Rajganpur.

Limestone is quarried 6 miles away from the mill, and is transported over a 2-ft. gauge railway system. Ample clay is available at sites on both sides of the railway track. Bauxite and iron-ore are brought from elsewhere, but

the mill is conveniently situated near the coal fields. Cement is manufactured by the wet process.

Mill Operations

Some 800 tons of limestone are transported daily to the mill. It is dumped into a concrete hopper from which it is transported by means of a 6-ft. wide inclined laminated conveyor, 50-ft. centers, to a 6- x 6½-ft. swing hammer crusher. The limestone is reduced in one operation from about 2-ft. stone to a maximum size of about 1 in. As the quarry operates during the day only, the hammermill is designed to produce in one shift sufficient material for the total 24-hr. requirement of limestone.

Crushed limestone is transported by a 32-in. inclined rubber belt conveyor, 300-ft. centers, to the top of a storage building. Here, it is either taken by horizontal belt conveyor direct to the feed hopper for the raw mill or is held in storage. From storage, the crushed limestone is later picked up by an overhead traveling grab crane and fed into the raw mill feed hopper.

Clay with water is prepared in the wash mill to a slurry which is ground with the crushed limestone in the raw mill to a finished slurry. This is an F.L.S. Unidan mill with a diameter of 8 ft. 6 in. and a length of 40 ft. It is arranged for central drive through a symetro gear coupled to a 1300-hp. autosynchronous high-tension motor.

After leaving the Unidan mill by gutter the slurry is taken to a storage department which consists of four vertical silos and one slurry basin with a total capacity of 175,000 cu. ft. of slurry. The silos are fed by means of four slow-speed slurry elevators, each of which is 95 ft. high, which are used to transport the slurry from the raw mill to slurry storage, between the slurry silos and from the slurry basin, to the feeding apparatus above the kiln inlet.

From the silos the finally corrected mixture of slurry is drawn into the circular basin where it is thoroughly mixed by mechanical stirrers with the aid of compressed air. The slurry is now ready for calcination. It is then fed into the rotary kiln, the feeding apparatus being snychronized with the kiln drive to ensure that the flow of slurry is automatically regulated should there be a change in the speed of the kiln.

Three-section Kiln

The high-economy F.L.S. Unax kiln has a diameter of 10 ft. 10 in. in the middle section and 11 ft. 10 in. at the inlet and outlet ends, with a total length of 475 ft. The normal output of the kiln is 500 tons per 24 hr., but, during peak demands, the kiln can be run at a somewhat higher output.

Government and plant officials at ceremony starting the new cement plant

Pulverized coal is used for firing the kiln, the raw coal being dried and ground simultaneously in an F.L.S. airswept Tirax mill. The hot air used in the Tirax mill for drying the coal is drawn from the kiln, but the mill is also provided with a coal-dust-fired auxiliary furnace which can be used when the raw coal is very wet. The raw coal for the mill is moved by overhead traveling crane from the storage building to a hopper over the feed table. From the feed table the coal is transported to the hopper above the mill by an inclined belt conveyor installation.

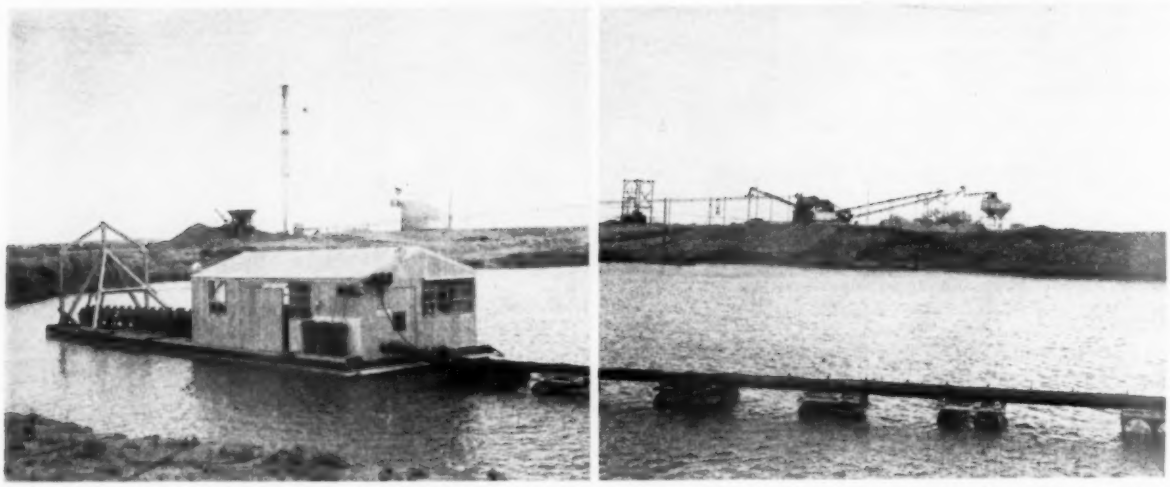
The calcination of the raw mix takes place at about 1500 deg. C. Clinker from the Unax cooler is discharged automatically on to a shaking conveyor which moves it to a storage building.

Clinker and gypsum are drawn from storage, as in the case of the coal, by feed tables arranged below hoppers in the storage building. An overhead traveling crane feeds the clinker and gypsum into these hoppers. The cement mill is an 8½- x 40-ft. F.L.S. Unidan mill designed for an 85-ton charge of grinding media. This mill is also arranged for a central drive through a symetro gear coupled to a 1300-hp. autosynchronous high-tension motor. The cement is ground in closed-circuit with a rotary separator and cyclone. The grinding installation is kept dust-free by means of a six-compartment automatic dust collector.

The finished cement is pneumatically pumped into large vertical silos for storage. From the silos it is taken to the packing house by screw conveyors. Packing and weighing into jute or paper bags is done automatically.

The cost of the new Orissa cement mill has been $3,473,000.

Slurry tanks in the background and slurry thickener in the foreground



Dredge is used for stripping heavy overburden. Slackline cableway excavator, background, excavates sand and gravel below water

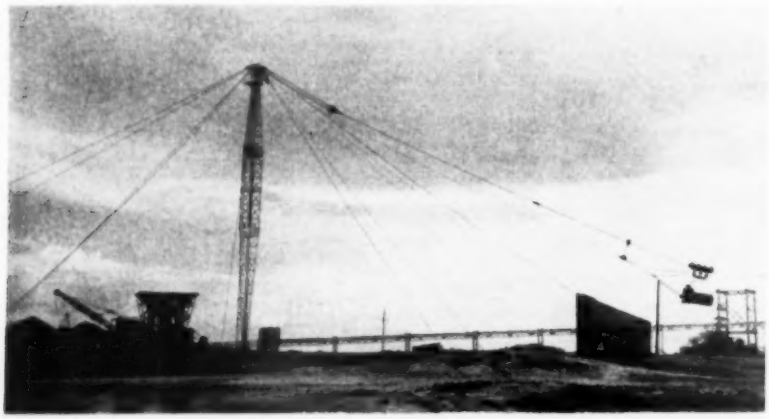
Strip Heavy Overburden With Dredge Recover Sand and Gravel With

•Dakota Sand and Gravel Co., Bismarck, N. D., removes up to 60 ft. of overburden with dredge to reach a 65 to 85-ft. sand and gravel deposit which is reclaimed under water

By WALTER B. LENHART

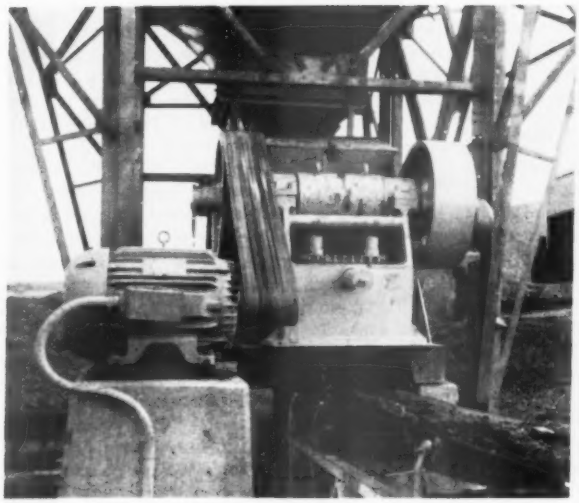
SAND AND GRAVEL DEPOSITS along the Missouri river, in the areas contiguous to the gigantic dams now under construction by the Corp of Engineers, U. S. Army, are spotty as to size with a large percentage of the deposits contaminated by lignite coal and other organics, and the so-called "chocolate-drops." One has to either go far afield from points of use to get acceptable material or dig deep for it.

"Chocolate drops" is the name given to an unsound gravel that is quite prevalent in the Missouri river bottoms, and elsewhere in eastern Dakotas and western Iowa. Most of the chocolate drops parallel conventional gravel sizes. They are usually deep brown to red in color, with a smooth surface. When these are broken open a core or kernel is revealed that is lighter in color and more porous in structure than the shell. A newly dug chocolate drop, will, on exposure to the air for varying periods of time, usually a month or so, disintegrate. It was said by one authority that the core of the "drops" was an iron-manganese carbonate. The surface of this rock oxidizes to a red iron manganese oxide. The rock is un-stable and a source of considerable trouble to operators in the areas mentioned.

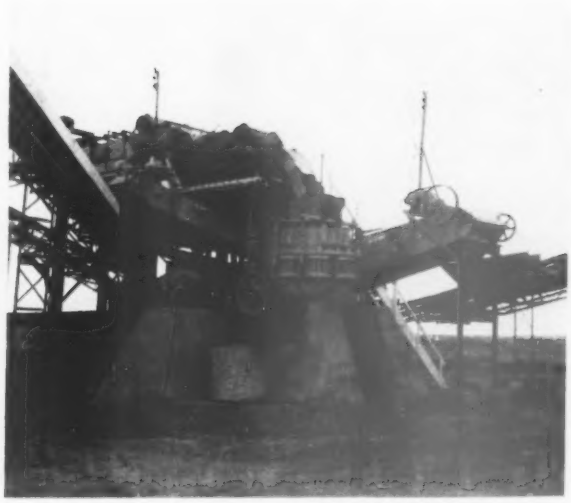


A slackline cableway excavator with 2½-cu. yd. bucket reclaims sand and gravel below water after overburden has been removed by dredge

Due to depletion of previously worked deposits near Bismarck, N. D., the Dakota Sand and Gravel Co., at its new operation, chose to excavate at considerable depth for material, and certainly when the relatively small population that can be served by the new plant is considered, has established an all-time high in the amount of overburden that has to be removed to get a satisfactory and adequate source of sand and gravel. From 44 to 58 ft. of overburden is removed to get 65 to 85 ft. of gravel. Paul Wachter, general manager of the Dakota Sand and Gravel Co. said in effect, "It was either a matter of paying out excessive amounts for long truck or railroad hauls and at the end of a year have nothing left but a lot of paid haulage bills, or, install suitable digging and earth moving equipment on our own ground and near our own plant and dig deep for our raw material. At the end of the year, we will at least have our equipment, and be-



A 15- x 24-in. jaw crusher reduces oversize



Two vibrating screens, above, with cone crusher, below

Cable-way Excavator

sides save a few dollars." Thus, depletion not only made it necessary to build a new plant, but in addition to go to such extremes to replenish their supply.

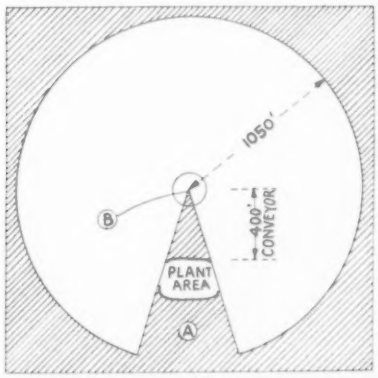
Dredge Used for Stripping

The stripping operation is rather unique for a 10-in. suction dredge is used for the purpose. In this area, the water level is from 10 to 15 ft. below the ground surface. At the outset a 45-ft. digging ladder, equipped with a Swintek cutter, was used. Later a 10-ft. extension was added to the ladder so that digging depths, when necessary, can be in the 45 to 47-ft. range. The dredge was supplied by the Eagle Iron Works and uses a Hetherington & Berner dredge pump. The overburden, which is essentially a clay-sandy soil, is pumped to the disposal area through 10-in. dia. steel spiral wound pipe. Before erecting the new plant, a considerable area was stripped.

Excavation Equipment

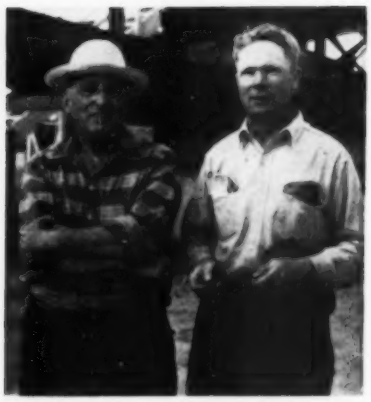
To excavate the gravel under its cover of 20 to 25 ft. of water, a 2½-cu. yd. Sauerman cable-way, or skyline excavator is used. This excavation unit has a 123-ft. high mast. The steel section is 113 ft. high with the base adding another 10 ft. The tail line for the Sauerman is movable. It consists of two standard gauge railroad flat cars that ride a semi-circular track. Two, 70-ton concrete weights are on the tail cars to give the necessary stability. The sky-line will operate on a 1050-ft. radius. This means that when this particular deposit has depleted itself, a mined out area circular in cross section and 2100 ft. in dia. will remain — except for the small segment where the plant is installed. The hoist on the digging unit is driven by a 250-hp. Allis-Chalmers motor. The hoist itself is a Class H-2-E Sauerman Bros. Inc., double-drum hoist equipped with Kellogg-American (Division of American Brake Shoe Co.) air compressor. The track cable is a 2-in. dia. American Steel & Wire 6- x 33 Type R, the load line is a 1-in. dia. Sauerman special excavator cable, and the tension cable is ⅞-in. dia. of the same make.

By reference to Fig. 1, it will be observed that from the receiving hopper for the cable-way excavator to the plant area, the distance is roughly 400 ft. A belt conveyor 400 ft. long delivers from the hopper to the plant. The purpose of this long belt is to re-



Sketch shows why 400-ft. long conveyor is located between cableway excavator receiving hopper and plant to permit a greater area to be mined. If "plant area" was closer to point "B", the quadrant area would be larger. "A" is the area, therefore, that cannot be reached by the excavator. From 85 to 90 percent of the area can be mined (Fig. 1)

Vibrating screens, above, with water scalper and sand screws, below, and to the far left is the double screw coarse material washer



Paul Wachter, manager, to the left, and **A. C. Christianson,** superintendent

duce the area of ground that cannot be reached by the cable-way excavator. It becomes obvious that if the plant is closer to point "B" that the pie-shaped segment will be larger than if the plant is moved farther away. At the Dakota Sand & Gravel Co. operation, roughly 92 percent of the circle can be excavated, however, the company expects to allow plenty of room for truck roads, ground storage piles, future additions, etc., so that 85 to 90 percent of the area will probably be removed. Material taken from under the water by the excavator is stacked alongside the receiving hopper to permit water to drain out of the matrix. The material is relatively small in size being roughly 50 percent sand and 50 percent gravel with practically all of it being minus 5-in. with a small proportion which is in the 3- to 5-in. range. By more adequate drainage at the receiving end, the material is easier to feed to the grizzly and crush at the receiving hopper. After the material has drained, it is reclaimed by a 1¼-cu. yd. crawler-mounted, Lorain clamshell having an Owens bucket. A D-4 Caterpillar equipped with dozer assists the Lorain in keeping the material pushed up close to the reclaiming rig.

Crushing, Screening, Washing

Under the receiving hopper is a 30-in. Cedarapids vibrating grizzly. The opening is 3 in. The plus gravel falls to a 15- x 24-in. Cedarapids jaw crusher with the throughs from the grizzly and from the jaw crusher going to a 24-in. belt conveyor, 400-ft. centers. The jaw crusher is driven by a 50-hp. Allis-Chalmers motor.

The washing and screening plant normally makes three sizes of gravel and a concrete sand. Later equipment will be added to produce a masons sand. The two normal sizes of gravel are; ¼- in. to ½-in.; and ¼-in. to 1½-in. However, to supply, and to meet the Bureau of Reclamation specifications, a small screen has been provided over bins to split the ¼-in.-1½-in. to a minus ¾-in. and a plus ¾-in. so as to reduce segregation.

Vibrating screens in the plant are all Cedarapids and, in the order of use, are: a 4- x 12-ft. double-deck; a 3- x 8-ft. double-deck; and a second 3- x 8-ft. double-deck screen, however, with only one deck in use (all operated wet). The second 3- x 8-ft. screen is over Butler bins, and is used to prepare material for Bureau of Reclamation specifications. All sizes of washed materials are stacked over reclaiming belt conveyor tunnels by 100-ft. long stacker belt conveyors that are 18 to 20 in. wide. All belt conveyors are Goodyear and ride Cedarapids idlers.

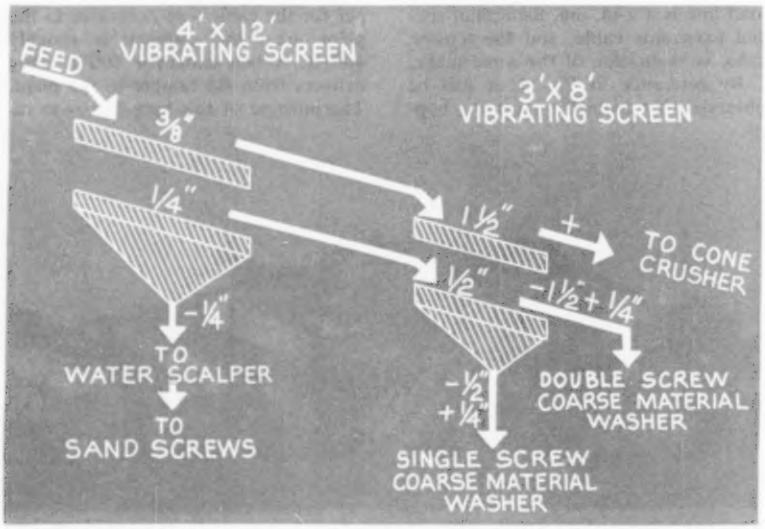
Plus material from the first bank of screens is carried by chute to a 3-ft. Symons cone crusher with throughs returned by belt conveyor to No. 1 conveyor. The larger size of gravel is re-washed before stockpiling by a 22-in. double, Eagle coarse material washer equipped with paddles and a trash rack. The ¼-in. to ½-in. is similarly washed and then stockpiled by a stack belt conveyor.

Sand is recovered by 24-in. double Eagle dewatering spirals ahead of which is a six-spigot discharge, Eagle water scalper. There is no valve mechanism on the spigots, just holes. The spirals are 22 ft. long, and operate in a tank having a width at the weir of 57 in.

Reclaiming belt conveyor tunnels are made up of two sections of reinforced concrete to which "cattle pass" culverts are added. These locally-made precast concrete units are intended to be used under highways so cattle can pass through them. They are oval in shape on top with flat bottoms, and of adequate height. The two concrete sections each weigh 8 tons and are bolted together. An 18-in. reclaiming belt conveyor, 40-ft. centers, with feed to the belt through reciprocating feeders, is operated in each tunnel.

Water for the plant is supplied by a 1800 g.p.m. 8-in. Fairbanks Morse turbine pump powered with a 60-hp. motor. It is mounted near the plant and gets its water from the lake formed by the mining operations. The plant is located about one mile south of Bismarck near the east bank of the Missouri River. The company installed a 41,000-volt power line from the town to the plant. In addition, a 750 kv. a. substation was provided. The plant motors use 440 volts and the dredge 2300 volts.

The operating season in the Bismarck area during a normal season is from April 25 to November 15. The plant operates without cover. All material from the plant is shipped by trucks as no railroad serves the area. The plant has a nominal capacity of 200 t.p.h. The new plant is about 3000 ft. from the former operation. A. C. Christenson is superintendent.



Flow of materials, showing screening, washing and crushing sequence of operations

Adds Employe Service Unit

LONE STAR CEMENT CORP., New York, N. Y., has added a new employe service building at its Bonner Springs, Kan., plant. The building, which is complete with an equipped kitchen, tile showers, steel lockers and radiant heating, will serve as a locker room, meeting hall and recreation center.

Opens Gravel Plant

CLYDE V. BOVEIA, Nashua, Iowa, has opened a sand and gravel plant near Nashua. Mr. Boveia will operate the washing and screening plant in conjunction with his earth-moving and contracting work.

Proper Soil Testing Improves Use of Agricultural Limestone

By O. T. COLEMAN*

ONE OF THE MOST IMPORTANT FACTORS contributing to Missouri's recent increase in agricultural limestone use has been its soil testing program. At present, 96 of the 114 counties in the state have county soil testing laboratories under the supervision of the county extension agents. These laboratories were all financed locally by farm organizations, civic groups, county courts, business men or bankers, advanced payment for tests by farmers or various combinations of these. No federal or state tax money was used for setting up any of these laboratories. Every county in Missouri either has a laboratory of its own or can have its soil tests made in an adjoining county laboratory. Whether in a laboratory or non-laboratory county, farmers can take their soil samples to the County Extension Agent, and he will either have the tests made at their own county laboratory or at one in an adjoining county.

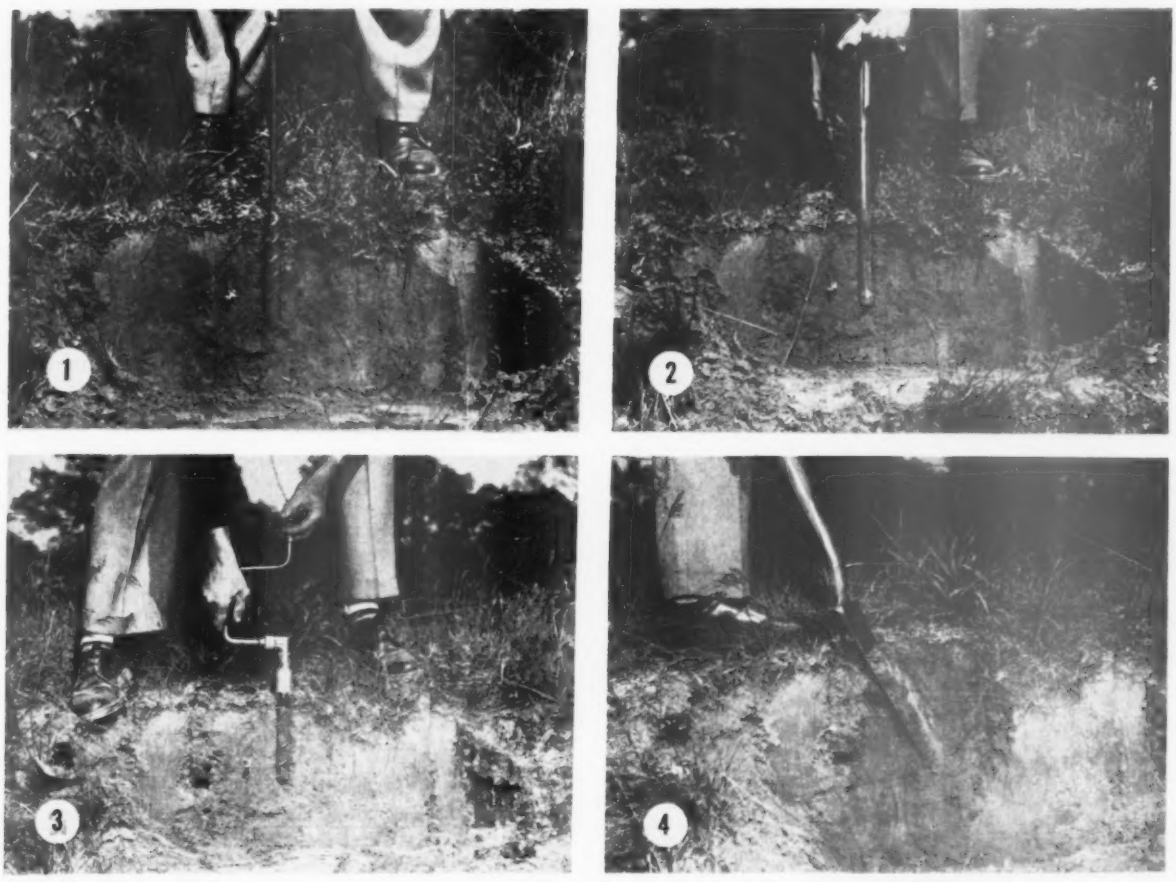
When taking soil samples, it must be remembered that the tests made on them can be no more accurate than the soil samples themselves. To get the best tests, composite samples should be taken to represent the surface 7 in. of each different kind of soil, or differently treated — or cropped area in the field. Where one plans to grow deep rooted crops like alfalfa and sweet clover, it is suggested that composite samples also be taken to represent the second 7 in., or the 7-14 in. depth of each different kind of soil.

Each of these composite samples, whether of the first or of the second 7 in., should be made up of at least five individual samples and, where the soil has been previously limed according to soil test recommendations, each composite sample of the surface 7 in. should not represent over 5 acres. On fields that have not been limed according to soil test recommendations within the last 6 or 8 years, each composite sample of the surface 7 in. may represent as much as 10 acres — providing of course, all the land included in this 10 acres is uniform.

When soil samples are taken to a county agent for testing, be sure he is given the best information needed regarding the kind of soil, its previous liming and soil treatment history, the crops recently grown and those it is planned to grow in the near future. This will permit a much more accurate analysis of the situation and should result in soil treatment recommendations or suggestions that better fit specific situations.

(Continued on page 73)

*Extension Specialist in Soils, University of Missouri, Columbia, Mo.



Illustrating four methods of taking soil samples for testing. Fig. 1: Soil augur. Fig. 2: Sampling tube. Fig. 3: Brace and bit. Fig. 4: Spade; if spade is used, only a uniform 1-in. vertical strip from each slice is taken

Fig. 1: Laboratory mineral-wool-blowing apparatus

Fig. 2: Close-up of molten charge being converted to wool

Experimental Results In

Testing Mineral Wool Raw Materials

• U. S. Bureau of Mines, Mississippi Valley Experiment Station, Rolla, Mo., has released reports on tests of samples from several states and Alaska to determine suitability of materials for mineral wool manufacture with recommendations for blending

By H. KENWORTHY[2] and M. L. MORELAND[3]

EVALUATION OF RAW MATERIALS for the production of mineral wool is a continuing project at the Mississippi Valley Experiment Station, U. S. Bureau of Mines, Rolla, Mo. Periodically the results of these experiments are made public; the latest publication having been made in 1951[1]. In the present paper, data are presented on testing samples of raw materials received since the above publication.

The major uses and the benefits of utilizing mineral wools are well known; however, new applications and specialty products are continually being developed. Uses and products are appropriately described in literature and by the respective manufacturers.

Raw Materials Samples

Samples were received from several states, and Alaska and are described under geographical subheadings.

ALASKA: A shipment consisting of limestone and shale from Alaska deposits was received from the Bureau of Mines Juneau office. The deposits are adjacent to and readily accessible by rail. Chemical analyses of the materials as furnished by the Juneau laboratory are presented in Table 1. These raw materials contain the necessary ingredients to blend and produce rock wool.

FLORIDA: Samples of three raw materials were submitted by Lenox H. Rand of Orlando. These were: (1) A phosphatic slag from Nichols, (2) a staurolite concentrate from Starke, and (3) a siliceous kaolin clay from Edgar.

Petrographic examinations showed: (1) The slag to consist chiefly of psuedo-wollastonite with a few metallic inclusions; (2) the staurolite concentrate was largely staurolite, kyanite, sillimanite and tourmaline, with lesser amounts of other heavy minerals; (3) the clay contained considerable free quartz mixed through the kaolin. Chemical analyses of the samples are shown in Table 2.

Comparison of possible blends of two or three of these materials with the ternary diagram for Al_2O_3-SiO_2-CaO shows that it should be possible to produce mineral wool from a number of blend combinations. For this purpose, the Fe_2O_3 in the staurolite is considered equivalent to CaO.

An impure limestone and a "river sand" were submitted for testing by Frank D. Bailey, manager of the Chattahoochee Chamber of Commerce.

Petrographic examinations were made of the materials. The limestone was found to consist chiefly of clay, quartz, feldspar, and dolomite, while the "river sand" was rather clean, containing only silica plus scattering grains of iron oxides and iron-stained quartz. The fine grain size of the sand would limit the amount that could be satisfactorily added to a cupola furnace without some type of agglomeration treatment.

Partial chemical analyses, given in Table 3, were made on the materials. A study of these analytical results indicates the improbability of producing satisfactory mineral wool from these

TABLE 2. — Analyses of Florida Samples — Rand

	Analysis, percent							
	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	P_2O_5	F	TiO_2
Slag	42.1	1.28	0.16	51.6	0.7	2.3	2.5	4.2
Staurolite	27.5	48.6	14.7	.25	2.1	—	—	—
Clay	78.8	15.0	.7	.31	.35	—	—	—

[1]Gorski, C. H., White, O. D., and Moreland, M. L. "Raw Materials for the Mineral Wool Industry" Bureau of Mines Report of Investigations 4821, 1951, 8 pp. Manuscript for present report was completed April, 1954.
[2]Metallurgist, Bureau of Mines, Rolla, Mo.
[3]Laboratory General Mechanic, Bureau of Mines, Rolla, Mo.

raw materials. There is an imbalance of basic and acidic constituents.

MISSOURI: Two rock samples were received from L. D. Thompson of Jefferson City with a request to determine if either was a natural wool rock.

Petrographic examination proved both rocks to be dense, argillaceous dolomite containing a few calcite stringers and finely divided siliceous material, probably from the disintegration of chert. A composite of the rocks was analyzed chemically with the results shown in Table 4.

TABLE 3.—Analyses of Florida Samples—Bailey

	Analysis, percent				
	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO
Limestone	34.7	33.4	—	13.9	1.0
River sand	98.6	—	1.56	—	—

TABLE 4. — Analysis of Missouri rock sample

Analysis, percent						
SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	Ign. loss	TiO_2
11.1	1.6	0.9	26.8	18.5	40.1	0.14

The analytical determinations, verified by the petrographic studies, indicated that these were not wool rocks. The ratio of acidic to basic constituents is not suitable. By adding silica to these rocks, a blend could undoubtedly be obtained that would form wool upon blowing.

TENNESSEE: Four rock samples from the quarrying operations of Tennessee Marble Inc., Knoxville, were submitted Carl V. Stafford. The samples were designated as gray, pink, and cedar marble and shale.

Petrographic examination of the materials indicated that all of them were mineralogically similar, consisting chiefly of calcium carbonate with some clayey material and a small amount of iron oxide.

To show more precise compositions, a portion of the cedar marble and a portion of the shale were analyzed chemically with the results given in Table 5. The analyses show that it would be impossible to produce mineral wool from these materials.

VIRGINIA: Three samples of slate were received from Owen R. Jeffrey of the Arvonia-Buckingham Slate Co., Inc., at Arvonia. Mr. Jeffrey requested that experiments be conducted to determine if the materials could be utilized in making mineral wool. The samples were marked No. 1 Green, No. 2 Purple, and No. 3 Hard.

Mineralogically the samples consisted essentially of chlorites and contained lesser amounts of iron oxides and quartz. Chemical analyses of the materials are shown in Table 6.

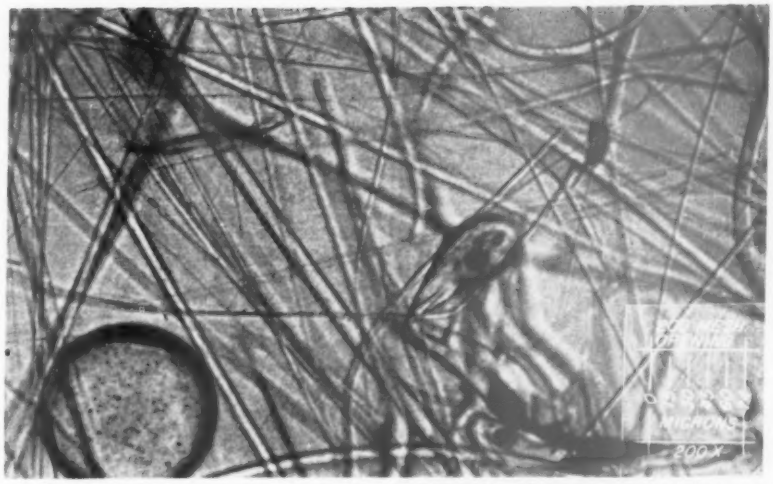


Fig. 3: Microphotographs of raw mineral wool, showing fiber and attached shot

Table 6 indicates that it would be necessary to blend basic materials with the slates to produce a mixture that could be blown into mineral wool.

Experimental Results

SAMPLE PREPARATION: Coarse raw materials were crushed through 10-mesh; and, if blending was necessary, the desired portions were thoroughly mixed before charging into the melting crucible. The latter were made from crucible-grade solid graphite rod stock. Lime used in certain experiments was made by calcining a high-grade limestone.

CONVERTING RAW MATERIALS TO MINERAL WOOL: Charges containing about 300 g. of raw materials were heated to a predetermined temperature by either a 3-kw. or a 6-kw. high-frequency induction furnace. Temperatures were approximately determined by optical pyrometer readings on the surface of the charge. In some instances these readings were a little low due to the thin white fume or smoke often emitted from materials at elevated temperatures. That this effect is small was shown by placing a suction in the upper portion of the crucible to remove most of the fumes and then rereading the pyrometer. Charges were held at the predetermiend temperature for a few minutes before pouring. During the pouring operation optical temperature readings were also taken of the stream of molten material before coming into contact with the blowing jet. The laboratory wool-blowing apparatus is shown in Fig. 1.

Blowing was accomplished by permitting the molten charge to fall in a thin stream just in front of a V shaped nozzle from which live steam was being ejected at 30 to 50 p.s.i. The impact of the steam on the liquid caused fiber and shot to be formed which was wafted into a large sheet iron horn from which it was later collected for examination. The pouring and manipulation of the steam jet were done by hand, using a highly skilled operator. No oils were sprayed onto the wool. A close-up of the steam jet fiberizing a stream of liquid charge is shown in Fig. 2.

TABLE 5. — Analyses of Tennessee Samples

	Analysis, percent					
	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	Ign. loss
Cedar marble	5.86	2.02	1.42	47.9	0.01	39.7
"Shale"	5.82	1.98	1.42	47.8	.01	39.4

TABLE 6. — Analyses of Virginia Samples

	Analysis, percent					
	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	Ign. loss
No. 1 Green	51.7	28.7	9.9	0.27	1.83	4.8
No. 2 Purple	54.5	29.1	9.6	.40	1.82	4.4
No. 3 Hard	55.2	25.1	9.7	.43	1.82	3.9

Evaluation of the Finished Wool

The matted wool fibers and the loose shot were separately removed from the horn and carefully weighed. The percentage of "free" or "loose" shot was determined on the basis of

TABLE 1. — Analyses of Alaska Samples

	Analysis, percent											
	Insol.	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	Ign. loss	P_2O_5	SO_3	CO_2	Na_2O	K_2O
Limestone, raw	2.8	0.8	0.7	1.2	51.0	3.4	41.0	0.002	0.18	39.4	0.4	0.7
Limestone, calcined (calculated)	4.7	1.3	1.2	2.0	85.0	5.7	.0	—	—	.0	—	—
Shale	75.5	60.0	15.1	9.0	.4	.07	4.3	.32	.21	—	—	—

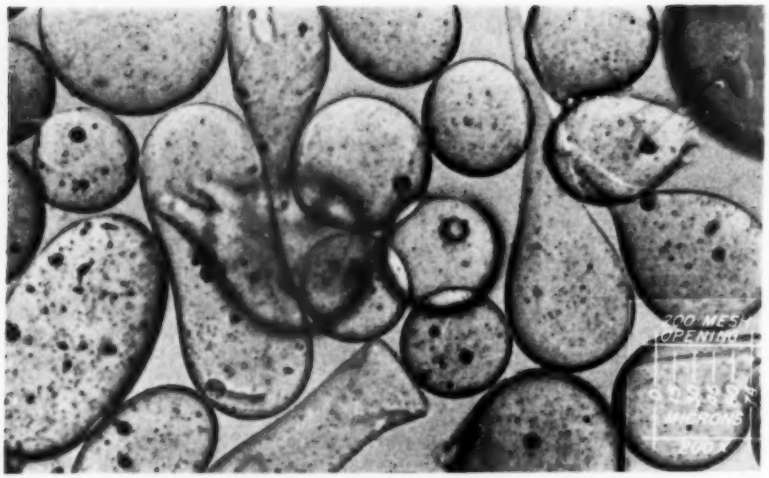


Fig. 4: Separated shot as seen under a microscope

the total weight of the two products. The wool also contained a substantial amount of shot which is subsequently designated as "attached shot." The percentage of the wool which was true fiber was determined by hydraulically crushing a weighed portion of the wool to break the shot free from the fiber, then elutriating the broken fiber from the shot. Microscopic examination of the separated shot and fiber shows that this method will give excellent differentiation between the two physical phases. This method of true fiber determination usually shows several percent more shot than determinations by other accepted methods. Often these methods do not remove the extremely fine shot from the fiber, and hence some shot, of little insulating value, is shown as fiber. Photographs of mineral wool, separated shot, and fibers are shown in Figs. 3, 4, and 5. Subject matter is from Alaskan test 51. Magnifications are 200 diameters.

Average diameter of the wool fiber is probably the most important criterion in evaluation of mineral wools. This was determined by measuring the short axis of a number of fibers and calculating an arithmetical mean. Measurements were made with a microscope fitted with a filar micrometer eyepiece.

Other factors affecting the quality of mineral wool are: Color, odor, stability of the chemical composition, and bulk density. For general usage, colors may vary from white to black. The most common obnoxious odor will be caused by quantities of sulfur in the wool, which may gradually convert to hydrogen sulfide. Low-sulfur ingredients will usually obviate this condition. Glassy wools may contain enough alkalies to cause chemical instability. This may be evidenced by crazing and cracking of the individual fibers or in some cases an efflorescence. An appreciable period usually elapses before symptoms of chemical instability are noticeable. Bulk density depends to a great extent on the handling of wool after it is blown; thus, from the same wool, different manufacturers might have finished products quite variable in bulk density. For this reason no bulk density figures are reported in this paper.

ALASKA: Mixtures containing 35 to 80 percent shale and the balance limestone were melted and blown to mineral wool. Optimum mix was found to be near 50-50. Data pertinent to experiments that produced acceptable wool are shown in Table 7.

Using over 50 percent of shale in the charges produced an acidic condition which resulted in viscous molten charges which blew into coarse fibers. Incorporating less than 40 percent of shale in the charge resulted in a blend which was too basic, thus producing short fibers and larger quantities of shot.

FLORIDA — RAND: A variety of blends of the phosphate slag, staurolite, and clay was found to produce acceptable wool. The testing had two objectives. One was to attempt the production of a superduty wool from the staurolite concentrate, and the other was to use the phosphate slag as a constituent to the fullest extent.

Direct melting and blowing of the staurolite concentrate were not successful up to 3600 deg. F., owing to the viscous nature of the molten ma-

TABLE 7. — Mineral Wool from Alaskan Shale and Limestone

Test No.	Percent by weight		Pour temp., °F.	Steam pressure, p.s.i.	Pouring time, seconds	Percent shot		Fiber diam., microns	Remarks
	Shale	$CaCO_3$				Free	Attached		
33	50	50	2810	40	34	15	42	10.5	Good-appearing white wools.
41	50	50	2900	40	22	15	50	9	
50	45	55	2800	40	20	17	46	9	
51	45	55	2850	32	27	13	42	8	
47	40	60	2690	40	29	20	47	8	

TABLE 8. — Mineral Wool from Florida Staurolite Concentrate

Test No.	Percent by weight				Pour temp., °F.	Steam pressure, p.s.i.	Wool properties			
							Temp., °F.		Percent attached shot	Fiber diameter, microns
	Staurolite	SiO_2	CaO	CaF_2			First fiber deformation	Became molten		
12	68	16	16	0	3100	52	1795	2770	59	5.4
21	70	17	5	8	3230	50	1850	2930	51	8.5
22	76	15	3	6	3540	50	1900	2950	58	7.3
13	80	8	12	0	3450	52	1760	2950	46	9.1
14	82	6	12	0	3315	50	1830	3020	51	6.3
15	84	3	13	0	3365	50	1905	2965	45	7.4
16	86	0	14	0	3360	44	1875	2910	48	6.1
17	88	0	12	0	3405	50	1875	2830	55	7.0

TABLE 9. — Mineral Wool from Florida Slag, Clay, and Staurolite

Test No.	Percent by weight			Pour temp., °F.	Steam pressure, p.s.i.	Pour time, seconds	Percent shot		Fiber diam., microns
	Slag	Clay	Staurolite				Free	Attached	
3	90	0	10	2755	42	23	6	44	5.7
6	80	0	20	2595	49	25	14	43	7.1
10	70	0	30	2610	48	29	17	43	7.6
17	90	10	0	2550	42	23	22	50	9.2
21	80	20	0	2600	40	20	19	46	10.7

TABLE 10. — Mineral Wool from Florida Limestone and Sand

Test No.	Percent by weight			Pour temp., °F.	Steam pressure, p.s.i.	Pour time, seconds	Percent shot		Fiber diam., microns
	Limestone	Sand	CaO				Free	Attached	
2	65	15	20	2910	48	13	32	46	6.9
3	58	20	22	2760	48	18	13	49	11.6
4	50	26	24	2642	48	17	23	36	7.3
5	45	40	15	3047	50	19	23	41	6.9
6	39	45	16	3047	50	22	15	32	11.0

TABLE 11. — Mineral Wool from Virginia Slates

Test No.	Slate	Percent by weight		Pour temp., °F.	Steam pressure, p.s.i.	Pour time, seconds	Percent shot		Av. fiber diameter, microns
		Slate	CaO				Free	Attached	
26	Green	61	39	2820	49	35	10	34	8.0
25	Purple	58	42	2810	49	35	16	48	10.5
22	Hard	61	39	2865	50	30	17	33	9.7
18	Green	32	36	2780	49	27	17	48	10.0
	Purple	32							

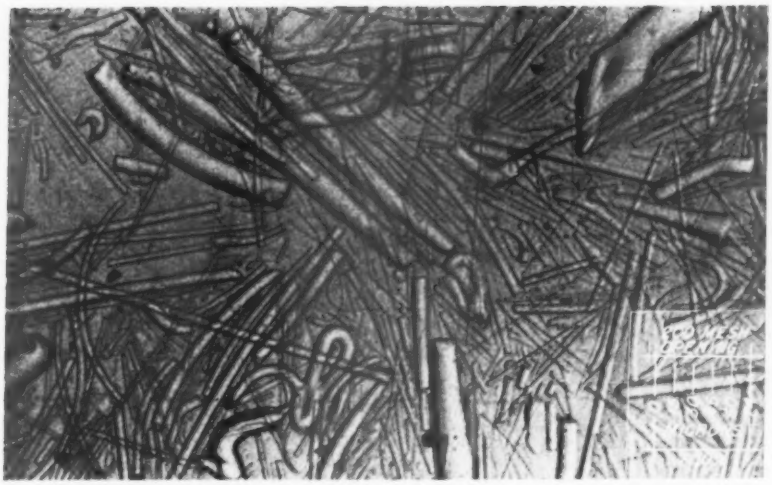


Fig. 5: Microphotographs showing separated mineral wool fiber

terial. By blending in small percentages of fluxes as shown in Table 8, blowable melts were obtained. The data in the column "First-fiber deformation" shows that these wools, while not of superduty grade with respect to heat, are far above white wools and better than most dark wools in heat-resisting qualities.

Results of experiments in which slag was successfully blended with staurolite concentrate or clay are shown in Table 9. The wool produced in these experiments was white and slightly fleecy; that is, it contains a few particles of flat or flaky shot.

FLORIDA — BAILEY: Preliminary experiments, in which the total charge consisted of impure limestone, produced very coarse wool. The viscosity of the molten material was such that the blown fibers were very coarse and glassy. The high alumina content of this material required additional silica and lime to make a blend of oxides that would lie within the mineral-wool-producing area of the Al_2O_3-CaO-SiO_2 ternary diagram. Results from blowing blended charges of limestone, river sand, and lime are shown in Table 10.

Although average fiber diameters in tests 3 and 6 are slightly coarse, all charges shown in Table 10 were blown to acceptable wool as evaluated in the laboratory.

MISSOURI: No blowing experiments were conducted on this material, since analytical examinations showed it was not a natural wool rock and the submitter did not request determination of additive constituents necessary to produce a blowable mineral-wool mixture.

TENNESSEE: Blowing experiments were not made on the suite of samples from Tennessee marble for reasons similar to those given above under "Missouri."

VIRGINIA: The addition of proper quantities of lime to any of the three slates produced mixtures that were readily blowable to acceptable mineral wool as evaluated in the laboratory. Results of representative tests on each slate are presented in Table 11.

Low bulk density and susceptibility to crushing deformation during handling contribute to place mineral wool in a high-tariff class when transported. For this reason, the industry tends to be distributed similarly to the population but with emphasis in locations dictated by climate, fuel, raw materials, industrial activities, and available market. Since raw materials suitable for the production of mineral wool are widespread in occurrence, interest in the evaluation of such materials is evinced on a national basis.

Proper Soil Testing

(Continued from page 69)

When soil samples are accurately taken, the above information is available and a record of the tests, the soil treatments applied, and the crops grown and removed from the land, tests do not have to be made oftener than 6 to 8 years. This plan — when the soil samples are accurately taken — will not only furnish better information for more accurate and better paying soil treatments, but will be cheaper and less trouble, in the long run, than taking random samples every 2 or 3 years.

Limestone Plant

NATIONAL INDUSTRIAL PRODUCTS CORP., Durkee, Ore., subsidiary of Morrison-Knudsen Co., is the newest limestone operation in Oregon. A description of the operation was briefly described in a recent issue of the publication of the Oregon State Department of Geology and Mineral Industries. The quarry is located about four miles southeast of Durkee in Baker County, and 28 miles southeast of Baker on the main line of the Union Pacific Railroad. According to the report, extensive exploration was carried on by Morrison-Knudsen interests before the plant was installed. Diamond drilling was employed as also was sampling by bulk carload shipments to several different potential markets. The exploration work reportedly showed that high-calcium limestone satisfactory for the various market demands could be produced in large quantity. Large-capacity crushing, conveying and storage facilities were installed, and a railroad spur and siding with a sufficient capacity for more than 20 cars per day were built. Present production is said to average about 500 tons per day. The deposit occupies the greater part of 820 acres and depth of stone available is said to be at least 160 ft. The company plans to serve heavy chemical and metallurgical industries. Operations are under the direction of J. V. Otter.

Gypsum Production

DOMESTIC MINE production of crude gypsum, during the first quarter of 1954, totaled 1,854,362 short tons, or 5 percent below the first-quarter, 1953 production, as reported by the Bureau of Mines. Imports, however, showed a 16 percent increase, with the apparent supply of crude gypsum only 1 percent less than in the same period of 1953. Production of calcined gypsum was 2 percent below that of the corresponding 1953 quarter.

Sales of agricultural gypsum, dental and orthopedic plasters, and plate-glass and terra-cotta plasters were considerably lower than in the same period of 1953. Among the building plasters, sanded plaster (including perlite premixed) continued its sharp upward trend. The combined classification of roof-deck and other building plasters increased 33 percent. Declines ranging from 8 to 16 percent each were noted in Keene's cement, gauging and molding plasters, base-coat plaster, and prepared finishes. Sales of lath continued to decline, while wallboard and sheathing were slightly higher than in the first quarter of 1953.

Kentucky Geologic Map

THE KENTUCKY GEOLOGICAL SURVEY recently announced the release of an interim state geologic map, printed in cooperation with the Agricultural and Industrial Development Board of Kentucky. The 27¼- x 14-in. map is produced on a scale of 1:1,000,000, is in four colors and has three structure sections. It is available from the Geological Survey at 307 Mineral Industries Building, 120 Graham Ave., Lexington, Ky. for 25 cents, plus 10 cents mailing charges.

General view of plant as viewed from primary crusher

Stone Plant Helps Build Big Dams

• M-C Granite Co., Fortson, Ala., processes a tough granite-gneiss stone for dams and commercial use. Plans to increase stockpiling and reclaiming facilities

By WALTER B. LENHART

LOCATED AT FORTSON, about 10 miles north of Columbus, Ga., is the M-C Granite Co. It is jointly owned by D. L. and R. F. McCullough of the Alabama Aggregates Co., Birmingham, Ala., and J. P. (Skeeter) Calhoun president of the M-C Granite Co. Mr. Calhoun is also president of the Consolidated Gravel & Pipe Co., Inc., and the Ferguson Sand & Gravel Co., all of Columbus, Ga. Data relating to the first mentioned sand and gravel company was published in ROCK PRODUCTS, August, 1952, page 160.

Haulage unit dumping to 42-in. by 12-ft. apron feeder followed by 30- x 42-in. jaw crusher. Scalper screen in the foreground

The Chattahoochee river acts as a part of the boundary line between Georgia and Alabama. Columbus, Ga., is on the river. This river in the years ahead may be important as an interstate, water-borne, transportation medium as a result of the dams already built, being built, and proposed. The river, for much of its length, runs north and south but north of Columbus it turns to the east and fingers to the north of Atlanta, Ga. Dams already built are Goat rock and Bartletts. The Jim Woodruff dam is now in the later construction stages and

Cone crusher fed by chute from screen, above

Final sizing screens are two 5- x 12-ft. units, one two-deck and the other three-deck, with primary crusher in the background

the Columbia and other damsites are proposed. In all, the impounded waters with adequate locks, will permit barge transportation to the north of Columbus with 8-ft. water depths. The need for coarse aggregates close to these dams is one of the reasons behind the origin of the M-C Granite Co., although the company is an important commercial producer in the area. The plant is now about a year and one-half old. The Jim Woodruff dam was described in ROCK PRODUCTS, October, 1952, page 180.

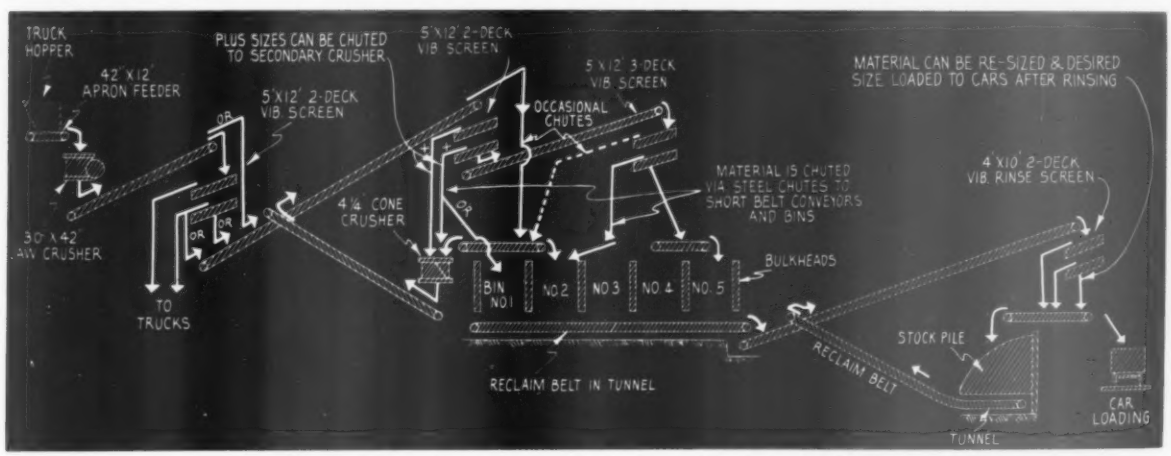
Quarrying Operations

The granite appears to be a granite-gneiss with the black biotite fraction appearing in well defined bands. Stripping is not an important phase, and consists of a modest amount of soil overburden including some brush and small trees. Wagon drills (four) are used for primary drilling, and fragmentation appears to be well above average for granite operations. A tractor and dozer, augmented by a dragline, handle the 3 to 5 ft. of overburden. A 5000-lb. drop ball is used for secondary breakage on the stone from the top level. A ¾-cu. yd. Koehring unit handles the drop ball. Primary loading is done by a 2-cu. yd. 43-B. Bucyrus-Erie shovel powered by a Buda diesel that loads to two Euclid rear-dump trucks used for the primary haulage. The plant has a capacity of 150 t.p.h.

Crushing and Screening Plant

The flow sheet shows the general plant practices which are built around the use of a 30- x 42-in. Universal jaw crusher fed by a 42-in. by 12-ft. Cedarapids apron feeder. The secondary crusher is a 4¼-ft. standard Symons cone. The first screen, a scalping unit, is a 5- x 10-ft. Tyler Ty-Rock, installed so that man-sized riprap (5 to 200 lb.) can be prepared, in which event the plus material falls directly into trucks. In the past it has been found advantageous to stockpile some of these coarser fractions and reclaim them later by trucks for additional crushing and sizing. Plans are being made to install a surge pile so this type of material will be stockpiled by a belt conveyor and recovered by a reclaiming belt conveyor operating in a tunnel.

Final sizing is done by two Simplicity screens, operated dry. The first is a 5- x 12-ft., two-deck unit, and the second is a 5- x 12-ft., three-deck unit. Plus sizes from the first screen can be chuted to the cone crusher and the throughs move by belt conveyor back to the first screen; thus the first screen is operating in closed circuit with the Symons unit. Selected sizes from the first screen can be sent by a short inclined belt conveyor to the second screen with all finished sizes being sent by chutes (or short belt conveyors) to ground-compartmented bins below. A reclaiming tunnel belt conveyor operates under the plant with material


TRUCK HOPPER
42" X 12' APRON FEEDER
30" X 42" JAW CRUSHER
TO TRUCKS
OR
PLUS SIZES CAN BE CHUTED TO SECONDARY CRUSHER
5' X 12' 2-DECK VIB. SCREEN
4¼' CONE CRUSHER
5' X 12' 2-DECK VIB. SCREEN
5' X 12' 3-DECK VIB. SCREEN
OCCASIONAL CHUTES
MATERIAL IS CHUTED VIA STEEL CHUTES TO SHORT BELT CONVEYORS AND BINS
BULKHEADS
BIN NO. 1
NO. 2
NO. 3
NO. 4
NO. 5
RECLAIM BELT IN TUNNEL
MATERIAL CAN BE RE-SIZED & DESIRED SIZE LOADED TO CARS AFTER RINSING
4' X 10' 2-DECK VIB. RINSE SCREEN
STOCK PILE
RECLAIM BELT
TUNNEL
CAR LOADING

Flowsheet of crushing, screening, stockpiling and carloading facilities

Charles Guthrie, sales engineer, right, and **L. G. Patton,** plant manager

delivered to the rinsing screen mounted over the railroad track. Rejects from this screen in the coarser sizes can be returned to a storage pile alongside the loading section from which they can be reclaimed from a second reclaiming tunnel under this pile.

The plant is on the Central of Georgia Railroad with shipments also going out by truck. The plant makes sizes of stone to meet any specification. Belts are 30-in. to 36-in. in width, and the longer belts are mostly American Rubber Co. riding on Universal idlers. The plant is driven by electric power generated at the site by a Model 379, 12-cylinder Caterpillar diesel-electric unit.

The plant was designed and built by McCullough Industries of Birmingham, Ala. L. G. Patton is plant manager and Charles Guthrie, sales engineer.

Oklahoma Test Road

A TEST ROAD, designed to settle the old dispute of portland cement concrete vs. asphaltic concrete highway construction, will be built in Oklahoma at an estimated cost of $734,425, as recently announced by the Oklahoma state highway director.

Bids are being taken on 3.853 miles of portland cement concrete, estimated to cost $406,394, and 3.934 miles of asphaltic concrete, estimated to cost $328,031. The paving will be built in alternate strips on both sides of the two 24-ft. driving lanes, separated by a 24-ft. grass median.

The concrete sections will have a 4-in. sand cushion and an 8-in. surface, lined on the outside with a 10-ft. sloping double bituminous shoulder built on a soil-cement stabilized base. The asphaltic concrete sections will be built on a 6-in. soil-compacted base, 7 in. of rock, and a 5-in. thick surfacing. The accompanying shoulders will be 10 ft. in width, on a 6-in. asphaltic stabilized base.

Determining Degree of Burning In Kilns By Liter-Weight of Clinker

DR. F. O. ANDEREGG

FOR THE DETERMINATION at the kiln of the degree of burning of a clinker, various methods are applied at different plants. The simplest of these implies that the operator feels the clinker pieces to determine certain size and assesses the firing from their appearance. In some cases the samples are broken and the surfaces of fracture are studied. Probably the most common method, however, is the determination of the liter-weight of a certain graded clinker-fraction. A more recent proposal is that the porosity of the clinker be measured in a so-called porosimeter.

Some writers, however, have questioned the value of the liter-weight measurement, and it may therefore be of some interest to give below a brief account of some of the investigations in this field published in the technical literature.

Anshelm, Germany[1], has found that the connection between liter-weight and the content of free lime in the clinker is more constant than might be expected, as is also the case with

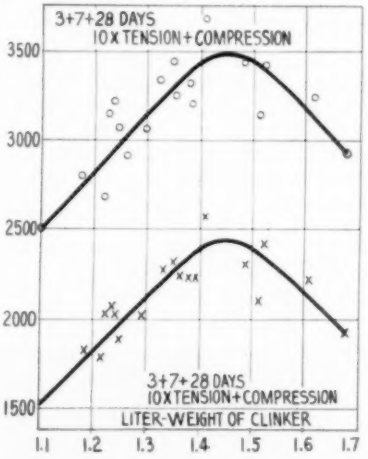


Fig. 1: Anshelm's diagram, above, indicates that the German clinker under study has maximum strength with a liter-weight of 1450 g/l. Shrinkage reduced with increasing liter-weight to 1400 g/l

the le Chatelier tests. He was unable to find any connection between the liter-weight and the time of setting, though he did find a very clear connection between the liter-weight and strengths. Anshelm's diagram, Fig. 1, of this relationship is reproduced herewith, and it appears from this that in the case of the clinker in question, a

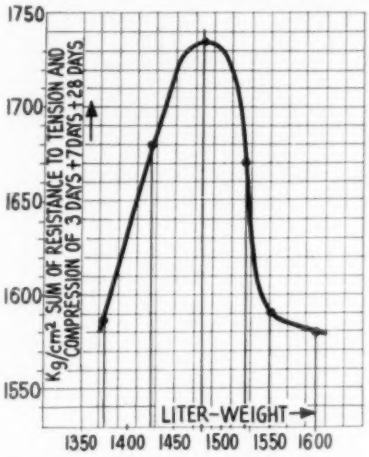


Fig. 2: Dubuisson, Luxemburg shows the results in this curve with over 1000 samples of clinker. A very pronounced maximum is indicated at 1480 g/l

maximum was obtained with a liter-weight of 1450 g/l. The shrinkage, too, differed with different liter-weights. It was reduced with increasing liter-weights up to 1400 g/l, where the shrinkage was at a minimum, after which the values rose once more.

In his article, Anshelm declares that every cement plant must find out by experiment the optimal liter-weight valid for itself.

Mussgnugg[2], Germany, has made a special study of the conditions obtaining in raw materials rich in sulphur. He has found a linear connection between the sulphur- content and the liter-weight.

Anshelm and Schlindler[3], Germany, have published the results from tests with clinkers having different liter-weights. In this connection they found that clinkers from a wet-process kiln had a maximum strength with a liter-weight between 1400 and 1500 g/l, while the shrinkage values were somewhat irregular with low liter-weights, though they did nevertheless have a clear minimum at 1400 g/l for samples 28 days old. When the age of the samples had risen to 90 days, the minimum was changed to a liter-weight of 1500 g/l.

In 1937 Mussgnugg published an

(Continued on page 107)

[1]Anshelm, **Zement 25,** (1936), pp. 633-644.
[2]Mussgnugg, **Zement 26,** (1937), pp. 1-7, 22-25.
[3]Anshelm and Schindler, **Zement 26,** (1937), pp. 502-507, 515-518.
[4]Mussgnugg, **Zement 26,** (1937), pp. 671-676.
[5]Dubuisson, **Revue des Materiaux No. 392,** (1948), pp. 145-146.
[6]Yoshii and Murakami, **Rock Products 54,** (1951), No. 11, pp. 88-89, 92.
[7]Zlatanos, **Revue des Materiaux No. 461,** (1954), pp. 47-50.

Theory and Practice of

LIME MANUFACTURE

Part XIII: Relation of rotary kiln diameter, length, volume and surface to the heat developed, and the heat absorbed for open unsegmented rotary kilns in the lime industry

By VICTOR J. AZBE*

BASICALLY THIS EVALUATION is all a matter of heat liberation and heat absorption. It is a matter of combustion space and effectiveness of this space; of heat absorbing surface, its effectiveness and relative amount of this surface to the amount of combustion space.

Given adequate air the more combustion space there is, the more fuel can be burned and heat liberated. But, this must be balanced by presenting the heat in absorbable form on one hand and, on the other, creating an adequate absorbing tendency through the exposing of an adequate amount of active heat absorbing surfaces.

It does not greatly matter in what form the heat is delivered to the vertical kiln which relies on convection heat transfer. In the conventional rotary, where heat transfer is mainly through radiation, such items as to whether the flame projects radiant heat, or is clear, how hot, and whether it is broad, filling out the space, or narrow and just centering down the kiln line, matters a great deal.

It is relatively simple to obtain increased combustion volume through larger kiln diameter, but in so doing heat absorption surface in proportion to the combustion space, is reduced for any given foot of length. While this may be compensated by increasing kiln length, the fact still remains that at the point of combustion, absorption surface ratio is lessened.

Unfortunately also, it is far more readily possible to make the combustion volume more effective than to make the absorption surface more receptive. Relatively more heat can be generated readily but it is not as easily absorbed.

The whole problem is extremely complex. Still a relative understanding is possible. Initially it should be visualized that the heat generated in the free kiln portion, meaning such heat as is transferable, is transferred either to the kiln wall exposed or to the upper surface of the material layer. Of this transfer, at least 90 percent is by radiation. Convection heat transfer to the lime and kiln wall surface is very low, and convection through penetration of the gases into the bed is insignificant.

The lime or limestone receives the heat at the surface of the bed by radiation, or in contact with the wall through conduction. The heat is spread through the bed partially through heat-

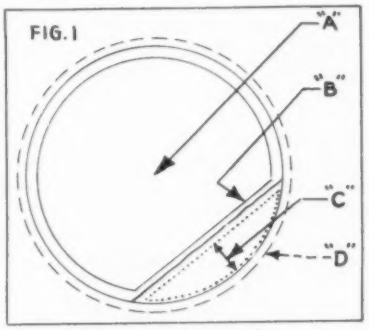


Fig. 1: Heat generating, heat release and heat absorbing phases in lime kiln. "A" indicates the heat generating space (combustion of fuel); "B" heat release surface (by the products of combustion); "C" heat absorbing surface (by limestone or lime); and "D" heat loss surface (convection and radiation to atmosphere)

ed particle gravity replacement and partially through conduction, in a manner very much like the flowing stream of diverse sized particles would be in a forward sliding solid mass. We may divide the functions into heat generating, heat release and heat absorbing phases, all taking place in the free space of the kiln and along the surfaces as in Fig. 1., to which the external heat loss surface is also added.

The aim, of course, is adequate and suitable heat generation in "A", and the highest possible absorption by "C." "B" is an essential intermediate and "D" an unavoidable element of harm, with further harm coming from the fact that the proper ratio of "C" to "A" is difficult or, in ordinary open kilns, is impossible to establish. Only through segmentation can this be accomplished.

As will be developed later, any rotary kiln of any diameter has sufficient heat generating space for any reasonable capacity expectation. If capacity is not obtained then kiln space is not properly utilized. The problem is always more of heat absorption than of heat generation. This, of course, is the reason why rotary kilns tend to such high temperatures; only at highest temperatures can the very limited heat absorbing surface area abstract enough heat to permit a high kiln capacity rate. The heat is generated but has no place to go, because absorption surface is virtually never in proper relation to combustion volume, and the larger the kiln diameter the worse this relation tends to be.

Of course, to a certain extent, conditions can be manipulated through control of combustion, size, and characteristics of the flame, or through close sizing of stone, or by incorporation of dams, or by high rotation.

TABLE I. SURFACE AND VOLUME RELATIONSHIP OF VARIOUS KILNS

Internal Diameter Feet	Assumed Kiln Length, Ft. Feet	Combustion Volume ½ Length — 15 Percent Load — Cu. Ft.	Capacity Tons Lime	Heat Developed B.t.u./cu. ft./hr. at Million/Ton	
				10M	6M
9	200	5400	325	25,100	15,060
8	175	3718	240	26,900	16,150
7	150	2450	150	25,500	13,900
6	125	1487	100	28,000	16,850
5	100	829	50	25,100	15,100
4	60	321	20	26,000	15,000

	Heat Release		Heat Absorption		
	Heat Release Surface Sq. Ft.	B.t.u./Sq. Ft./Hr.	Heat Absorption	B.t.u./Sq. Ft./Hr.	Proper Kiln Length, Ft.
9	5400	12,800	3160	18,850	260
8	4200	12,200	2450	17,900	210
7	3150	10,500	1845	14,900	160
6	2220	10,000	1312	13,980	125
5	1490	8,000	880	10,400	80
4	730	6,860	420	8,700	40

*Azbe Corporation, St. Louis, Mo.

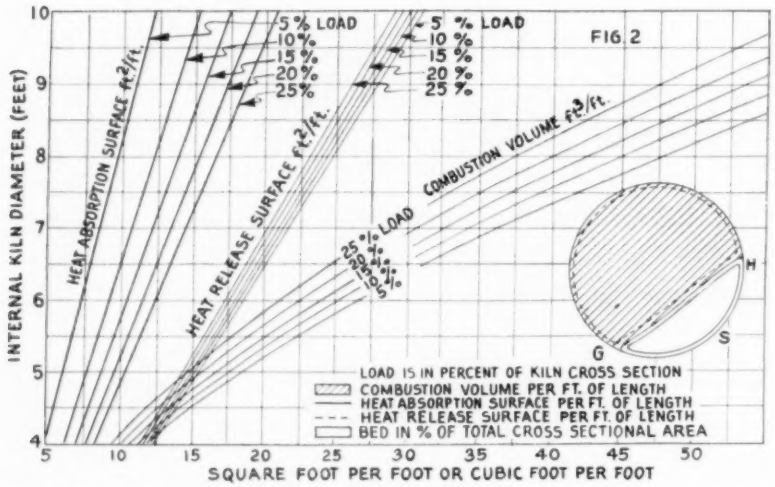


FIG. 2
INTERNAL KILN DIAMETER (FEET)
SQUARE FOOT PER FOOT OR CUBIC FOOT PER FOOT
HEAT ABSORPTION SURFACE Ft.²/Ft.
HEAT RELEASE SURFACE Ft.²/Ft.
COMBUSTION VOLUME Ft.³/Ft.
5 % LOAD
10 %
15 %
20 %
25 %
H
G
S
LOAD IS IN PERCENT OF KILN CROSS SECTION
COMBUSTION VOLUME PER FT. OF LENGTH
HEAT ABSORPTION SURFACE PER FT. OF LENGTH
HEAT RELEASE SURFACE PER FT. OF LENGTH
BED IN % OF TOTAL CROSS SECTIONAL AREA

Fig. 2: Rotary kiln combustion volume relationship to heat release and heat absorption surfaces to varied kiln load

While all this helps, the burden of improper surface to volume relation is always present in all but the very smallest diameter kilns.

Fig. 2 presents the dimensional elements for kilns with inside diameters of 5 ft. to 9 ft. and 5 percent to 25 percent loading, load constituting percent of kiln cross section filled. Even 15 percent is a heavy load ordinarily obtained only in kilns of low slope equipped with dams or when operating at low rotational rates.

The lime receives heat along the chord "G"-"H," and along its "G"-"S"-"H" arc. Along the chord the heat reception efficiency is highest due to direct radiant impact and because part of the heat along the arc is lost through the wall.

The greater the combined chord and arc, the more heat there is received directly as well as indirectly but the wall exposure to radiation is slightly reduced. However, with the greater arc the wall will cool more and so, on exposure, will be receptive to a greater amount of heat.

It will be noted, however, that with greater diameters, the chord and arc ratios quickly reduce and while the depth of bed increases, it is of little value as heat enters only along its outer surfaces.

The rapid increase of combustion volume is plainly notable. It quadruples for the doubling of diameter while the heat release and heat absorbing surfaces only double. Also important is the indication of the great amount that the heat absorbing surface can be augmented through the increase of kiln loading.

In Table I data is given covering a series of kilns of varied internal diameter and of the more conventional length. The capacity quoted for these kilns may seem high but it is obtained on all but the largest of the group. It is one ton of lime for 35 cu. ft. of total internal volume.

Of course there are many factors that enter. It is not all a matter of heat absorption surface and the necessary rate of absorption at the capacity quoted, but this certainly is the most important factor. The tabulation shows that the larger kilns are at serious disadvantage compared to those of smaller diameter, and performance is hampered by too short length. If all kilns were placed on an equal basis, then normally those of small diameter would be shorter and those of large diameter longer than the figures given. Proper relative length would be that given in the last column but this is only proportionate length and is not meant that it is the proper length. Much more than just this must be considered. Properly, surface should be available at the point where heat is generated rather than by extension of the kiln length as such extensions are comparatively ineffective.

For the medium size kiln, 8 ft. inside dia. by 175 ft. long and up, possibilities of high capacity minimize rapidly while for this kiln, a 240-ton output is logical. For a kiln of 9 ft. inside dia. by 200 ft. long, it is not possible, not even if the kiln is given a proportionate length based on a heat absorption surface of 260 ft. It is this condition that again suggests that a kiln should comprise segments which not only present the kiln with the desired surface, but do so at the point where the kiln heat transfer tends to be the least effective.

While heating surface is the most important element that enhances with the increase of the kiln loading, the increase in retention time or time of travel is also in a degree of benefit. The main advantage is that the heavier bed will be of a lower average cross-sectional temperature, resulting in an increased soaking action, thus tending to lower temperatures along the chord and arc surfaces of the bed and improved heat transfer.

In addition to the above, with increased load the time of retention will increase faster than the depth of the bed, thus allowing for a better heat penetration to the off size masses isolated at the rotational center. This condition for 5 ft. and 8 ft. inside diameter kilns is shown in table, below.

From these two tabulations it may be deduced that heat penetration possibilities are greater in kilns of smaller diameter.

Then beyond this, for any given number of r.p.m., the rate of bed exposure will be greater in the case of large compared to small kilns, as it is not this but the circumferential speed that counts. On the other hand, since large kilns contain a much greater load unless their speed is quite a bit higher, the rate of replacement in the bed will be considerably less.

● THIS IS THE LAST ARTICLE of the series that started in 1951. There is much that still may be commented on. In fact, the series could be continued indefinitely, but as in the main it deals with the open type of rotary kiln, we had better terminate the series and apply ourselves to the kiln of the future.

TIME OF TRAVEL

Internal Diameter	Kiln Length	Kiln Capacity	Time of Travel Hours Percent Loading 20	15	10	5
5	100	50	5.6	4.2	2.8	1.4
6	125	100	5.0	3.8	2.5	1.7
7	150	150	5.5	4.1	2.7	1.4
8	175	240	5.2	3.9	2.6	1.3
9	200	325	5.6	4.2	2.8	1.4

THE TIME OF TRAVEL RELATION TO DEPTH OF BED

	8 ft. Inside Diameter				
Loading of Kiln	20	15	10	5	Percent
Time of Travel	5.2	3.9	2.6	1.3	Hours
Depth of Bed	2.03	1.65	1.25	.779	Feet
Ratio Time / Depth	2.56	2.37	2.09	1.6	
	5 ft. Inside Diameter				
Loading of Kiln	20	15	10	5	Percent
Time of Travel	5.6	4.2	2.8	1.4	Hours
Depth of Bed	1.26	1.03	.78	.48	Feet
Ratio Time / Depth	4.4	4.0	3.6	2.9	

General view of Clarence Center, N. Y. plant of National Gypsum Co.

DUST CONTROL In Gypsum Plants

• National Gypsum Co., modernization program includes addition of electrical precipitators supplementing cyclone dust collectors and continuous calcining process

By MAURICE C. CROOK*

IN LINE WITH THE NATIONAL GYPSUM COMPANY'S PROGRAM of progress and modernization, considerable attention has been paid to dust control measures. While this applies to both mines and processing plants, the most important changes for better dust control methods have occurred in the processing plants. What has gone on at the Clarence Center, N. Y., plant is representative of all units.

It is well known that gypsum is mined by two methods; underground and open quarry. No matter how mined the rock must be reduced to a very small size before it can be further processed, after which it is heated, or calcined, and about 25 percent of its water content removed. The "stucco" which remains is very fine and creates dust whenever in any kind of movement.

Dust control starts when the fine rock goes through a final grinding in Raymond mills. These mills are equipped with cyclone-type dust collectors, 8 ft. in diameter, with 8- x 18-ft. tubular bags, attached to the vents. Thus, dust is not only reclaimed but better working conditions are also assured.

Calcining is done in kettles 10 ft. in diameter by 13 ft. high and the newer ones have extension tops. Dust and moisture arise from these kettles and are blown off through a flue. In some National Gypsum plants this dust is collected by other Raymond cyclone collectors and reclaimed for further processing, but at Clarence Center and in some other units more efficient methods of dust control have now been installed.

Electrical Dust Precipitators

Originally there were five coal-fired calcining kettles in operation, each with a cyclone dust collector, but recently another kettle has been added. This radically new type kettle has a Cottrell electrical precipitator to trap and remove dust from the stacks. Within the collector high tension electrodes collect and discharge dust into hoppers, where it is reclaimed. These units are 98 percent efficient, and the fine dust so reclaimed will in time pay a large part of the $190,000 cost of installation.

Three of the old kettles also have been equipped with the new electrical precipitator installations and the two remaining kettles, with their cyclone dust collectors, are to be closed down soon. It is estimated that production from the new kettle and three older ones will equal or exceed that from the five original units.

Both types of collectors are found in other National Gypsum processing plants. The electrical types are augmenting the cyclones in some instances. In the Savannah, Ga., plant there are four 16-ton capacity Ehrsam oil-fired calcining kettles, all with Raymond cyclone dust collectors, and in a recently completed expansion program another of these older type kettles was installed.

Continuous Calcining Process

In the New York (Bronx) plant, purchased in 1935 from Atlantic Gypsum Products Co., there were five old-

(Continued on page 112)

Close-up of several of the main manufacturing structures at Clarence Center

*Assistant Director of Engineering, National Gypsum Co.

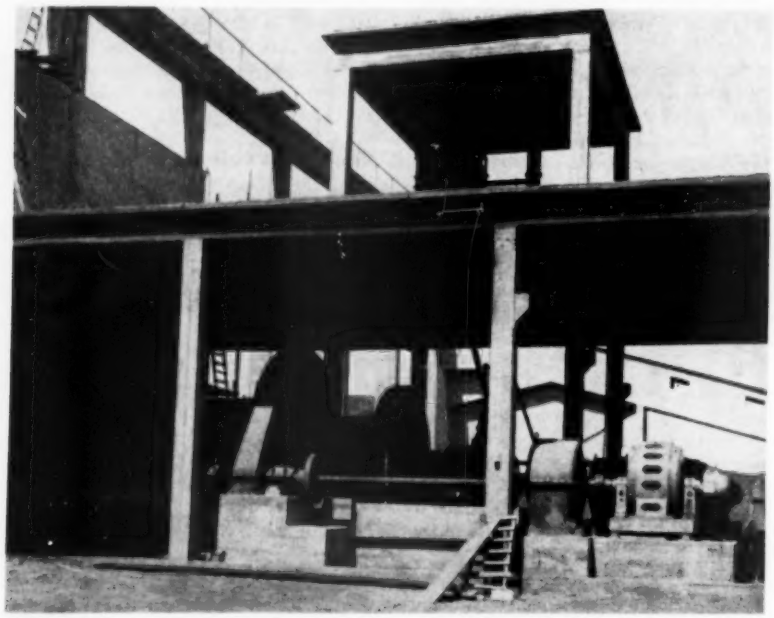
Panoramic view of new cement plant which is located about 50 miles south of Lima, Peru, South America

Peru's Newest Cement Plant Generates

• Compania de Cemento Chilca S. A., will soon place a new cement plant in operation 50 miles south of Lima, Peru. It will have an initial capacity of 1500 bbl. per day. Two sources of electric power will be available, a 500 kv.a. steam turbo-generator and a 500 hp. diesel-electric plant as an auxiliary

By H. O. E. HOLMQUIST

A NEW CEMENT PLANT located 50 miles south of Lima, Peru, approximately 4 miles from the Pan American Highway, constructed by the "Compañia de Cemento Chilca S.A." and utilizing the limestone quarries in that area will be started during 1954. This new cement plant is located in the small dried-out river bed of Corral Grande, running north to south about 4 miles from the town of Mala.



Mill building showing the two 8- x 29-ft., three-compartment mills, one for raw grinding and the other for finish grinding

Peruvian engineers first surveyed these quarries at this location and their reports were later confirmed by the firm of Sherwin F. Kelly Geophysical Services Inc., Wilmington, Dela. The quality of the raw material is excellent, and reserves amount to more than 100,000,000 tons.

The company was formed by a group of Peruvian industrialists. Ernesto Nicolini is president, and among the directors are Emilio Guimoye, Ismal Barua, Juan M. Raffo and Pedro Rosello. H. O. E. Holmquist is in charge of the technical direction of the plant.

Authorized capital of the company is 50 million soles, or approximately $3,000,000.

The cement plant has been completely engineered by F. L. Smidth & Co. A/S, Copenhagen, Denmark, which is also supplying all of the cement-making machinery. The construction work is in the hands of the well-known Peruvian firm of Florez & Costa, S.A. Layout provides for future expansion of the plant and the initial capacity will be 1500 bbl. of cement per day.

The plant installations cover an extensive area located less than half a

Clinker is first crushed in a hammer mill and then transported by drag chain conveyor to storage

Its Power

mile from the quarries. Entering the Corral Grande and following the road to a point near the limit of cultivation, the plant site is located on an inclined plateau. Several bungalows, designed as living quarters for the engineering staff, are located approximately one mile southwest of the plant. A small hotel, with essential conveniences is being built to serve as living quarters for unmarried employes. A housing development for workers and their families has been built about half a mile from the plant consisting of four one-story blocks of houses. Each block has seven two-bedroom houses, with kitchen, dining room, and a spacious area in the rear for recreation or gardens.

Construction and Layout

It is a wet process plant of simple and practical design. The limestone is transported by trucks from the quarries to the crushing plant where a single-acting hammermill is capable of reducing the stone to size in one stage for raw grinding. From the hammermill, the crushed stone is transported by an inclined belt conveyor to the open type raw material storage area.

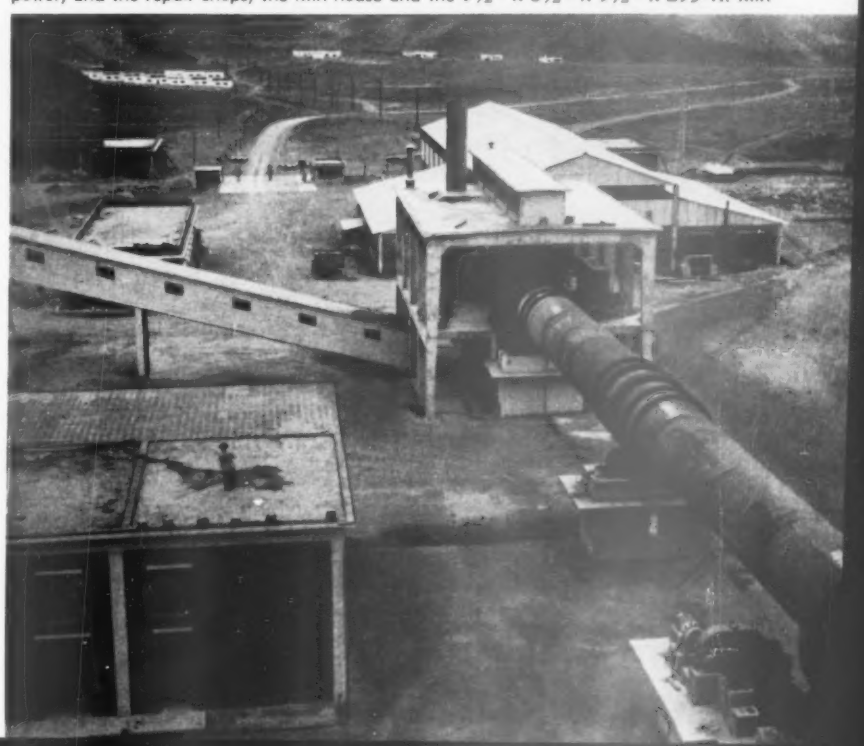
This storage area is equipped with an overhead traveling crane provided with a 6-ton bucket which can deliver the crushed stone to the feed bins for the raw mill. The raw grinding is performed by an 8- x 29-ft. Unidan three-compartment mill. Slurry produced by the mill is pumped to the four slurry silos by 3-in. centrifugal pumps. In the silos, the slurry is thoroughly blended by means of compressed air and corrected to maintain a uniform mix.

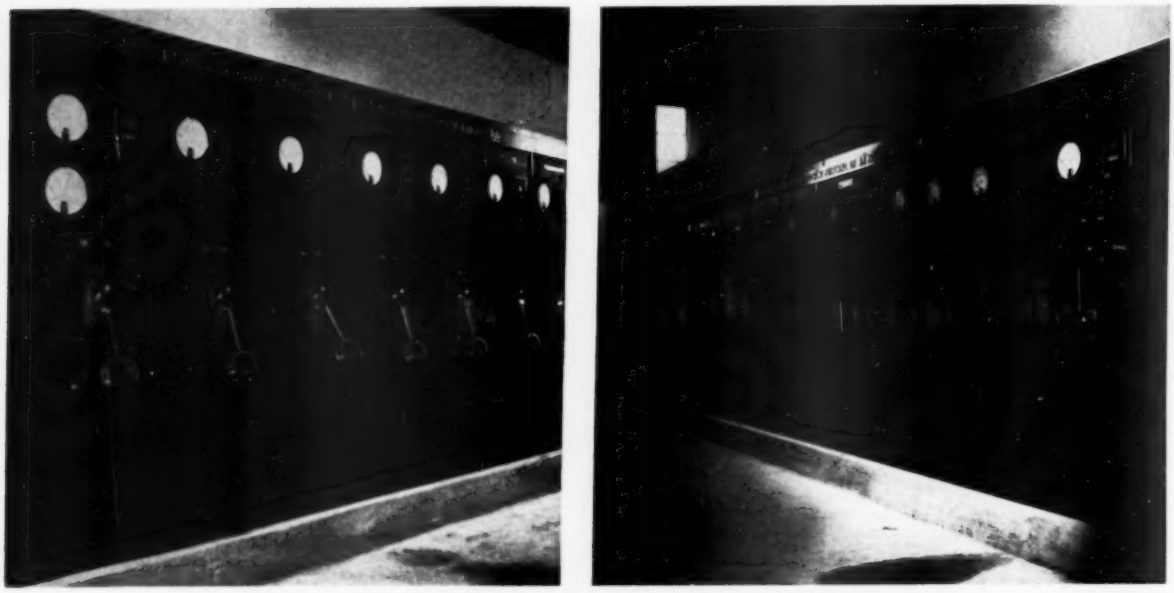
From the silos the slurry is pumped to the kiln department, and is fed to the rotary kiln by a rotary scoop feeder the speed of which is synchronized with the kiln speed. The kiln is an oil-fired, all-welded 9½- x 8½- x 9½- x 295-ft. rotary kiln. The kiln is provided with a heat exchanger system and a Folax grate cooler for clinker.

The centralized control panel is equipped with the conventional instruments for controlling the kiln operation, the slurry feed, the oil firing equipment and the Folax grate cooler.

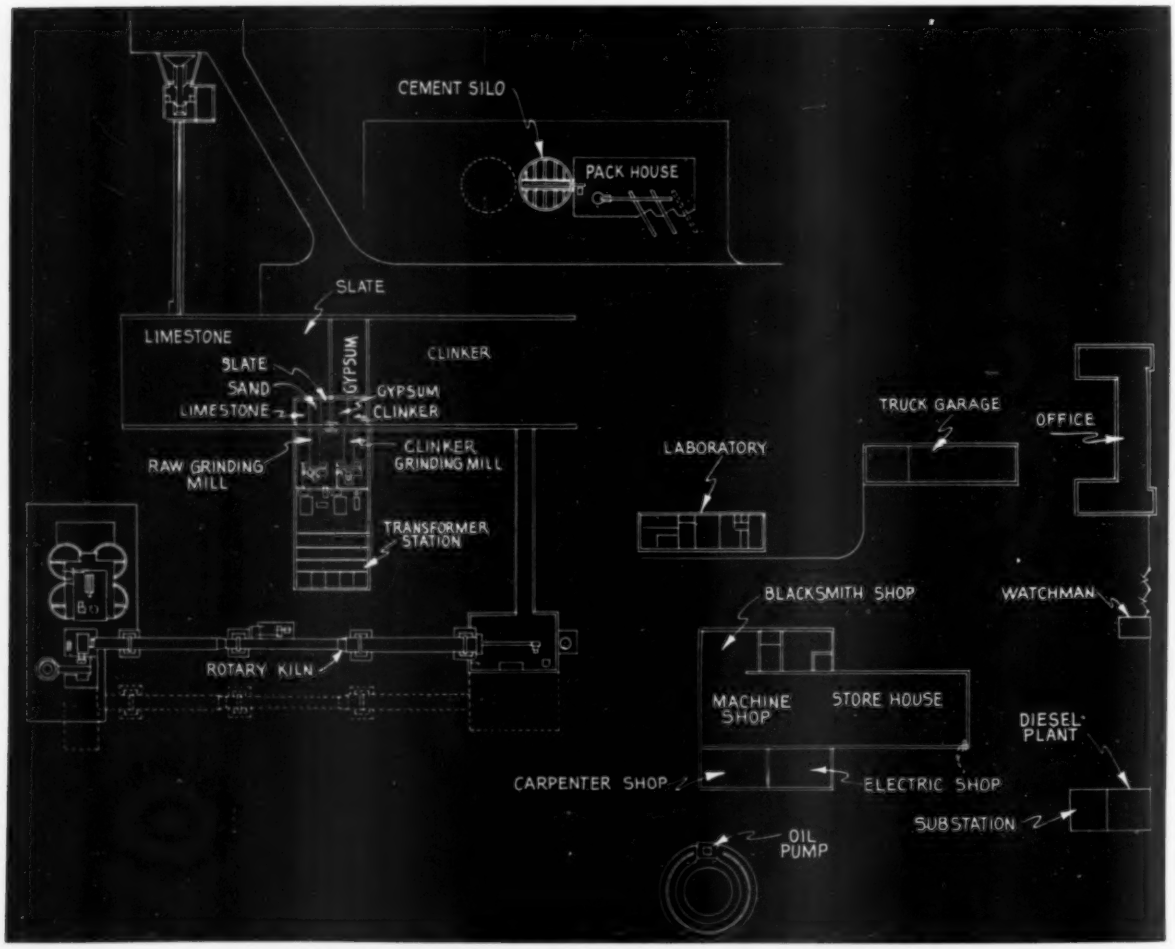
Clinker leaving the cooler is crushed by a small hammermill. From the

View of new cement plant during construction. Toward the foothills may be seen housing provided for employes. Starting from the background, the plant buildings are the office, laboratory, clinker conveyor and substation. To the right, the structure in the background houses the 500 hp. diesel driving the 460-volt generator supplying auxiliary power, and the repair shops, the kiln house and the 9½- x 8½- x 9½- x 295-ft. kiln





Two of the substation panels; one for 23,000 volts and the other for 460 volts

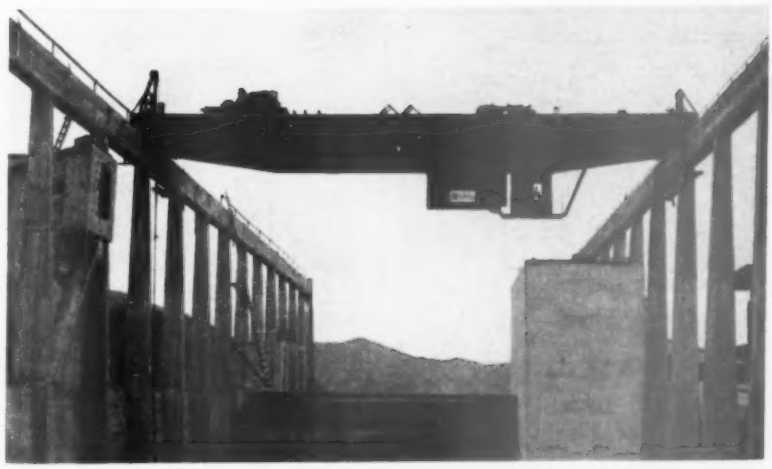


Layout of Peruvian cement plant which has an initial capacity of 1500 bbl. per day

hammermill, the crushed clinker is conveyed by a drag chain conveyor to the clinker storage, and to the bin over the cement mill. Clinker grinding, with addition of gypsum, is done in open circuit by an 8- x 29-ft. Unidan three-compartment mill. In order to cool the cement during the grinding operation, the last compartment in the mill is provided with an F.L.S. water injection system.

A Fluxo pump will convey the cement from the mill to the storage silo in the packing department. The cement will be packed in 50 kilo paper bags by an automatic six-spout Fluxo packer.

The plant is further provided with a well-equipped machine shop and storage building, and in a separate building is housed the laboratory with all essential equipment for testing the raw materials and the finished product.



Overhead traveling crane operating over storage area

Power Plant

After having studied the various possibilities of generating power for the plant, the engineers of Cia. de Cemento Chilca arrived at the conclusion that a steam generator installation would prove the most suitable from the point of view of efficiency and economy. The internationally known Swiss firm of Brown-Boveri & Co. made the necessary studies and, on their recommendation, one 5000 kv.a. steam turbo-generator and one boiler with a capacity of steam corresponding to the present power requirements for the plant were installed. The installation of one additional boiler is planned in connection with a future plant extension, thus utilizing the full capacity of the generator. This installation, the first of its kind in Peru, using a seawater condensation cooling system, will be erected on a beach adjacent to the Pan American Highway.

The equipment for the generating plant will be supplied by Brown-Boveri, while the construction of the steam boilers is in the hands of the Italian firm of Franco Tosi. For the installation of the seawater pumping station and the piping for the cooling system, a stone pier will be built extending approximately 600 ft. from the coast into the Pacific Ocean.

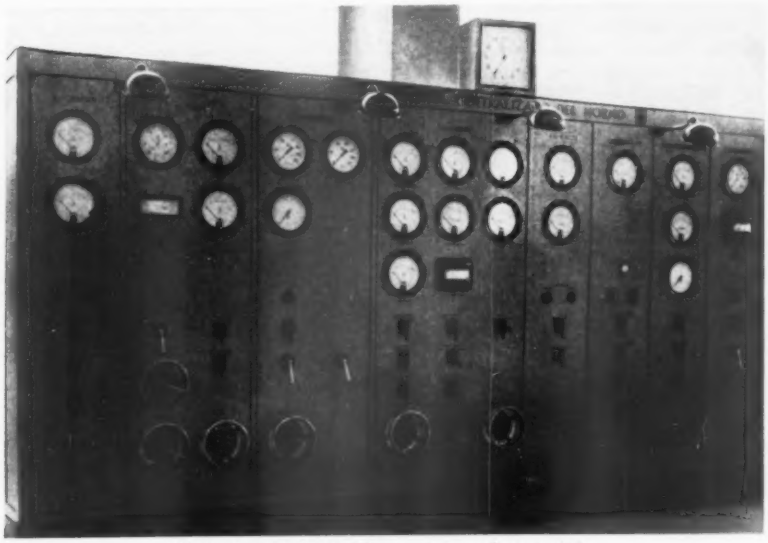
Power will be transmitted from the steam turbo-generator plant to a transformer substation located near the cement plant by a 20,000-volt transmission line approximately 5 miles in length. The generating plant will be oil-fired.

An auxiliary power plant is in operation consisting of a 500-hp. Sulzer diesel engine, directly coupled to a 460-volt Oerlikon three-phase alternator. This equipment was obtained from the well-known engineering firm of Custer & Tommen, S.A., Lima.

Two pumping stations supply portable water from the Mala River, approximately 4 miles from the cement plant. The water is carried by a 6-in. pipe line to an approximately 500,000-gal. capacity reservoir located about 500 ft. above the plant level and approximately 1100 ft. above the river.

Cement Shortage in Peru

The rapid expansion of private and government construction projects in Peru since the war has created a serious cement shortage. When the Chilca plant is in operation, the annual production of Peru will be about 2,500,000 bbl., equal to 0.3 bbl. per capita. This is still far below the production in many other South American republics; such as, Chile, Colombia, Uruguay, Argentina and Brazil, where the production averages 1 to 1.5 bbl. per capita, not to mention Venezuela where the capacity equals 1.8 bbl. per capita.



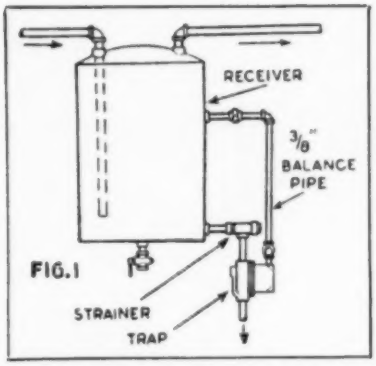
Central control panel for operation of rotary kiln

Mica Discovery

AN UNEXPECTED SOURCE OF MICA was recently discovered in Davy Crockett Lake behind Nolichuckey Dam, near Greeneville, Tenn. The Tennessee Valley Authority, which owns the dam and lake, believes there is "a considerable amount of valuable scrap mica in the silt that has accumulated there." Sampling has indicated that it is present in commercial quantities and T.V.A. is willing for someone to recover it on a royalty basis.

Stock Increase

DRAGON CEMENT CO., INC., New York, N. Y., has increased its authorized stock from 300,000 to 600,000 shares, following a special meeting of its stockholders. Holders of record on September 11, 1954, received a two for one share stock split.



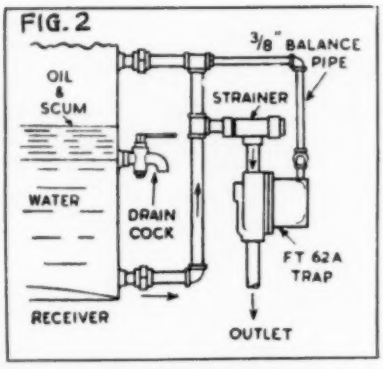


Fig. 1: Automatic trap drains air receiver of compressor. **Fig. 2: Drainage** of air receiver with accumulation of water, oil and scum by use of ball float trap

• Suggested modernization of air line piping includes automatic draining to eliminate water or oil, installation of adequate strainers, and the use of air filters

By LEO WALTER*

Efficient Piping of Compressed Air

THERE ARE MANY INSTALLATIONS of compressed air lines in use which are outdated, and need improvement. One of the most important features of modern piping of compressed air is the application of automatic draining for elimination of water, or of oil and water mixture from the piping system. Drain cocks are still widely used in existing piping systems, but their efficiency depends on the attention of plant operators, and it is known how unreliable the "human element" sometimes can be.

However, the remedy is as simple as possible. First, the best thing obviously is to prevent water or lubricating oil getting into the piping system at all. By automatically draining coolers or receivers, water and oil can be conveniently eliminated before it enters the piping system. Fig. 1 illustrates diagrammatically the drainage of a large receiver by means of a float-operated trap. When draining air mains, the traps should always be as close to the drain point as possible. It is important that the water should be able to flow freely to the drainage point, and traps should always be below the lowest point of a pipeline.

If an air trap is fitted at the end of a long connecting pipe, or to a receiving vessel, when the trap has discharged, the pipe or vessel will be filled with air. Unlike steam, this air cannot condensate and form liquid, so the valve or the trap would remain closed.

Overcoming Air Locking

As shown in the illustration, a good way to overcome this locking of air is to connect a small bore balance pipe from the top of the trap body to the air space above the water level in the main or receiver. The water can then displace the air in the trap body and flow into the latter to be discharged. For correct draining of liquid from an air receiver, the trap has to be installed with a balance pipe between receiver and trap body in order to prevent air locking; i.e. accumulation of air which would block drainage.

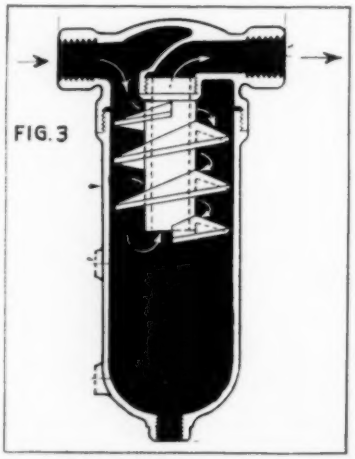
Fig. 2 illustrates automatic drainage of a receiver where oil and scum accumulate on the water surface. The trap is again fitted with a balance pipe and the drain pipe is taken off at approximate liquid level, as shown. A separate drain cock allows oil to run off direct from the receiver.

A reliable ball float trap, designed for continuous automatic elimination of liquids from air receivers and pipelines, should be preceded by a suitable pipeline strainer, as shown in the two previous installation diagrams.

Having now dealt with the receiver, it might still be necessary to drain larger piping systems because air cools down during flow, with consequent falling out of moisture. As mentioned before, the water should be brought to each drainage point by providing a sufficient drop in horizontal pipelines but, in practice, older piping systems do not take this point into consideration to assist drainage by running pipes with continuous fall. The best point for drainage is then for horizontal pipes where risers occur, providing a suitable point of accumulation of liquid.

Pipeline Strainers

Various types of pipeline strainers are used to protect air traps from becoming leaky due to lodging of dirt particles between seat and disc, such as the well-known Y-type strainer, and there are also available simple angle types. Basket strainer types are also



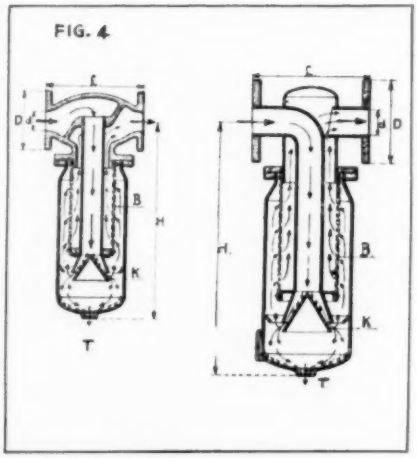


Fig. 3: Centrifugal type of air separator. **Fig. 4: Self-made types** of welded air separators, using change of direction and bronze mesh filters; (B) bronze gauge filter; (K) repulse cone; and (T) outlet to trap

*Consulting engineer, Cheltenham, England.

available with a cover on top, which can be easily dismantled.

The importance of pipeline strainers to protect apparatus and instruments in compressed air lines cannot be overemphasized. Placed in front of air traps, reducing valves, meters, etc., a strainer having the correct screen is invaluable for securing uninterrupted service of the gadget, which it protects. There is only one snag in practice; namely, strainers have to be emptied and cleaned at regular periods of time. Preventive maintenance of plant equipment usually includes strainers in the schedule for servicing, but some just neglect them until they become partly choked, thus producing a less welcome obstruction and pressure loss. This brings up the question of checking and of metering pressure and also the rate of air flow in pipes.

Air Separators

In order to separate liquids from air in pipelines, a multitude of designs are in use, some of them efficient, others less efficient for higher requirements. It is difficult to advise generally which types should be used, because the choice of a pipeline separator (Fig. 3) depends entirely on working conditions, and on requirements for cleanliness of air.

The physical phenomenae used for separation of liquids from compressed air can be:

(a) Use of baffles and simultaneous reduction of velocity of flow. The body can be made of cast steel, or for larger sizes can be welded, and the baffle systems can be taken out by loosening the cover for cleaning purposes. Large surfaces placed in diverging angles divide the air-stream into small volumes, and provide a means of repeat change of direction of the air filaments, ultimately eliminating droplets on the baffle surface. Chambers, where droplets can accumulate and flow vertically downwards into a sump and drained by a suitable air trap, are used.

Another principle which splits the air stream into filaments, is described in the following: The usual methods of extricating water and oil from compressed air are satisfactory for many purposes. However, it might be that the air should be used for a very delicate process, where even fine traces of water or of lubricating oil would spoil the product. In this case, a type of apparatus, which uses a non-chemical, purely mechanical method for thorough purification of the air, has been repeatedly used by the writer for improving less efficient existing oil separators. The apparatus can be inserted after the existing oil purifier or filter, and is shown in Fig. 4 in two forms for small pipe diameters.

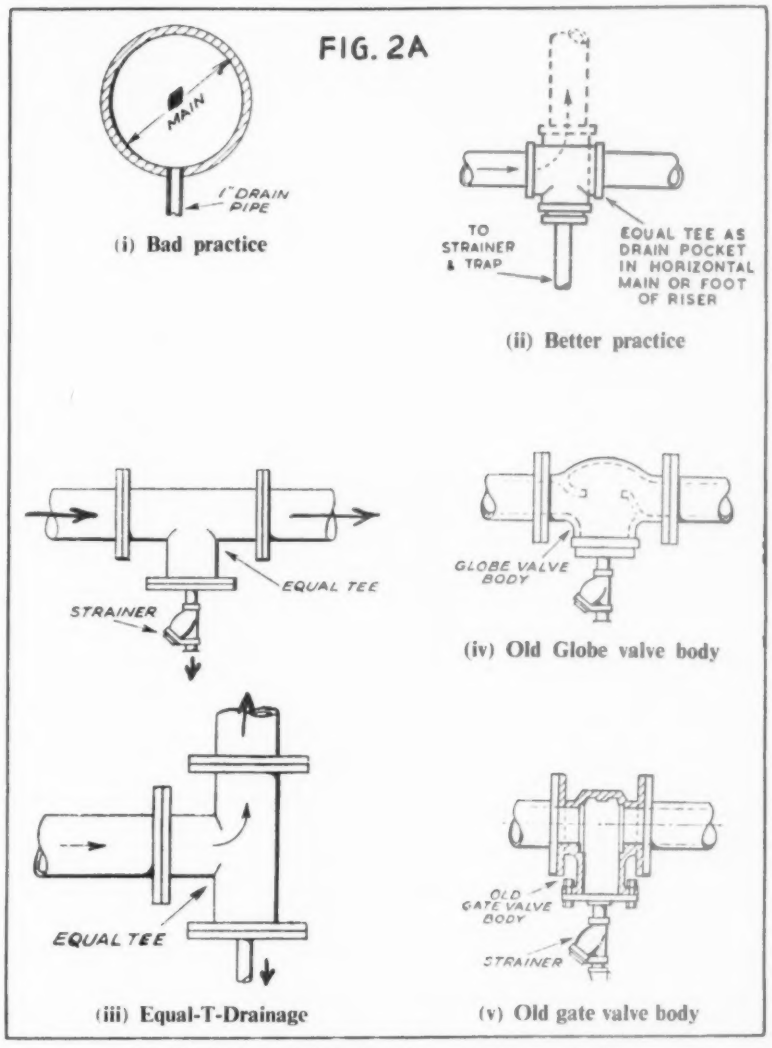


Fig. 2A: Various methods of drain connections on air pipes

This super-separator consists of an upper body part, which can be either a C.I. valve body, as shown in (1), or welded as illustrated in (2). The lower part consists of an outer shell, welded in the usual way, and of an inner central tubing, at the end of which is fixed a conical body. The air is diverted by the repulse cone, and the heavier liquid particles are pushed towards the conical metal surface, adhere to it and flow by gravity into the sump. Direction of air flow is then reversed, whereby heavier liquid particles fall out. The stream of air is now forced through a large surface of a bronze filter gauze and thus split up into many fine air streams, which later pass at reduced velocity through several layers of fine-mesh bronze gauze, supported by a perforated metal cylinder. This filter gauze cylinder extricates not only the finest solid particles from each small air filament, but also forces water and oil droplets out. The liquid particles form fine paths of liquid at the outer cylinder surface, which flow by gravity downwards and drop ultimately into the sump.

The surface of the screening gauze cylinder is usually five to ten times larger than the free area of inlet and outlet of the apparatus, and no objectionable back pressure can be developed. The actual filtering surface within the fine-mesh gauze, being wrapped 10 to 20 times around the supporting perforated cylinder, can only be guessed, but offers an enormous opportunity for any liquid particle to depart from the air.

Fig. 5 illustrates a more elaborate super-purifier for larger pipe diameters. The air enters the apparatus through a central opening, and is forced through a central filter gauze cylinder, as shown.

When passing at reduced velocity through this central filter tube, the larger droplets of water and oil are

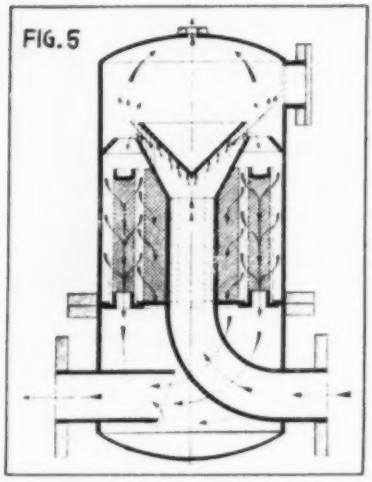


Fig. 5: Suggested super-separator, using several filters

extricated, and flow by gravity into the lowest part of the apparatus.

A double-filtering method has proved efficient, where standard baffle separators could not cope with the demand for cleaning. Here again, a greater number of layers of fine-mesh bronze gauze must be used to provide the required great filtering surface in the central large filter cylinder, and in the smaller filters arranged concentric around it. Practical experience has proved that, by inserting this type after the conventional type of air separator, the air can be used for very delicate purposes.

Two working conditions, however, must be adhered to: the oil-water mixture must be automatically drained as soon as it forms, otherwise the air might pick up impurities; and the apparatus must be regularly cleaned, and frequently inspected for cleanliness.

The first condition demands fitting of the correct type of ball-float trap, acting continuously to drain the apparatus. The second condition of cleanliness requires regular cleaning of the filter surfaces, facilitated by the design, which allows lowering of the lower part of the outer shell without dismantling of the top section from the pipeline. The filter cylinder is thus exposed, and can be cleaned by steam spray, or water spray, or by brushing with hot water, or in extreme cases with a solution of caustic soda, which latter operation must be followed by careful washing with clean water.

The design of Fig. 5 allows withdrawal of the central filter and of the small filters together with the lower section of the shell. The small filters can then be withdrawn by loosening the fixing nuts in the lower part, or they can be cleaned when exposed by lowering the shell. A handhole for larger sizes allows inspection and cleaning of the sump in shorter intervals. Very regular and frequent inspection and cleaning of the trap is also advisable for efficient operation.

Where working conditions would make too frequent cleaning necessary, two separators can be arranged in parallel, and isolating valves fitted, which enable one apparatus to be in operation while the other is cleaned. A test cock with suitable sight-glass in or after the outlet enables observation of the separating effect, indicating whether water accumulates in the sight-glass or is absent. An oily surface of liquid appearing in the sight-glass indicates necessity for cleaning the apparatus. Fine-mesh bronze gauze should be kept in store for replacements, or complete filter cylinders can be stored as spares.

A good quality of cylinder lubricating oil for the compressor is important. Excessive lubrication must, of course, be avoided because it would unnecessarily increase the duty of the separator. The advice of reputable suppliers of lubricating oil should be sought, in order to ensure the use of the best possible oil quality to facilitate separation. In practice, it has sometimes become necessary to do a little experimenting to find the right oil quality which does not decompose and remains in droplet form for elimination. Where the latter is not the case, only chemical washing of the air will extract oil, but this method requires careful drying of the air after wet treatment, and is costly.

(b) A third method of separating liquid droplets from compressed air is the use of centrifugal force. The air enters as a spiral movement, and droplets of liquid are thrown by centrifugal force against the outer wall or walls, where they are outside the air stream and flow downwards to the drainage point. One design has fluted walls with grooves, forming duct for facilitating continuous flow of liquid towards the sump.

In very delicate applications of processed air for air agitation in processing vessels, where air comes into direct contact with the liquor, the author has found it advisable to fit, in addition to the usual main separator near the compressor, several final single separators immediately in front of each piece of process equipment, in order to take out the last traces of oil or dirt particles from the air. The general layout, as used by the writer in many plants before the war, is shown diagrammatically in Fig. 6. Oil and moisture-free filtered air is secured for delicate jobs by applying a main separator, a super-separator, and individual air filters in sequence.

Where existing separators seem less efficient, it may be that by changing from an outdated air trap to a modern trap design, installation of an equalizing pipe might improve the function of the main separator. By fitting individual filters with suitable traps near each point of use of compressed air, the whole system can be greatly improved.

Systematic Survey

The only way to ascertain uses and misuses of existing compressed air systems is a systematic survey, starting with the compressor plant and its auxiliaries, then inspecting the pipelines, and ending with examination of air consumption at the points of use. Wastage of air can have many causes, and may occur unnoticed for any length of time, unless signal or alarm apparatus are applied, or unless a continuous rate of flow measurement discloses abnormal air consumption.

One of the major causes of waste is leaking joints in the pipe work. Another cause is defective valves and pipe fittings.

Once a survey has disclosed the major causes of waste, counter measures are comparatively simple. Too large air outlets on point of use can be corrected by reducing same. In or-

(Continued on page 112)

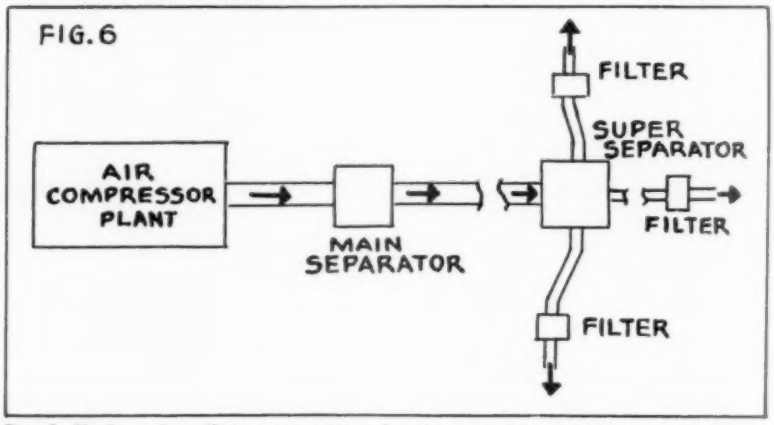
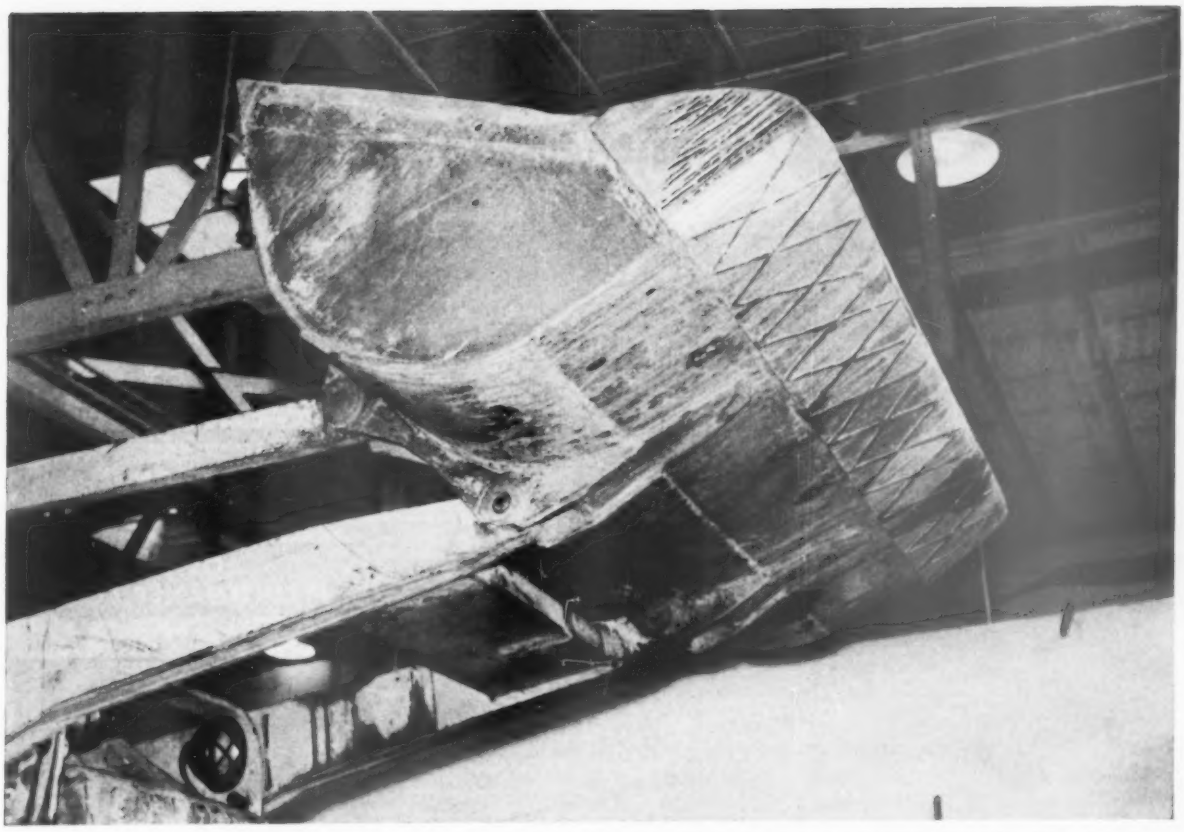


Fig. 6: Hook-up for efficient separation of moisture and impurities from compressed air used with pneumatic tools

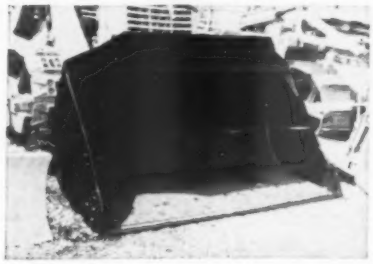


Hard-faced with Stoody 21 along the lip and side plates, this scoop holds size and load capacity. A self-sharpening lip makes it easy to load.

PROTECT THE LIP AND SAVE THE SCOOP
—A simple Stoody hard-facing procedure for loaders

Protecting scoop loaders from wear is a relatively simple hard-facing job. Results are generally two-fold; 1) The bucket holds original size, thus retaining full capacity and 2) lips become self-sharpening, insuring easier loading.

MANY TYPES—Although many scoop loaders are manufactured today, hard-facing procedures are similar on all. Wear usually concentrates along the bucket lip and extends up both inner and outer sides of the end plates. (Caution: Hardened steel lips as furnished by some manufacturers are not suitable for welding until surface hardening has been worn through.)



End plates are protected inside and out with a series of parallel stringers or cross-hatched beads of Stoody 21.

HARD-FACING DETAILS—A single ¾" wide band of Stoody 21, along the top edge of the lip, accomplishes two purposes:

It provides maximum wear protection for intense scuffing and abrasion against earth, paving materials, etc.

It makes the scoop self-sharpening by keeping the top surface from wearing as rapidly as the base metal.

End plates are hard-faced by a series of parallel or cross-hatched stringers, both inside and outside and along the leading edge.

Replace severely worn lips with steel plate cut to size and hard-face as described above.

Stoody 21 is suggested for protecting scoop loaders because of its high abrasion resistance and impact strength. These two features are a direct result of high alloy content—yet Stoody 21 is a low cost electrode. This and other equipment-saving applications are described in the Stoody Guidebook. Ask your Stoody dealer for a copy (consult the "Yellow Pages" of your phone book) or write direct.

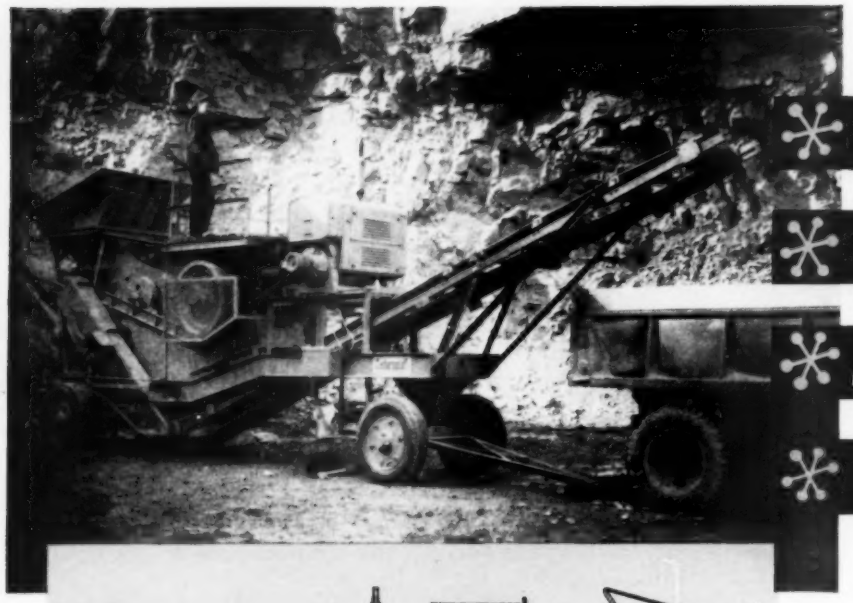
The scalloped edge on this scoop is a variation that has been found to give excellent results under some conditions. Note the hard-facing material along the edge.

STOODY COMPANY
11929 East Slauson Ave.
Whittier, California

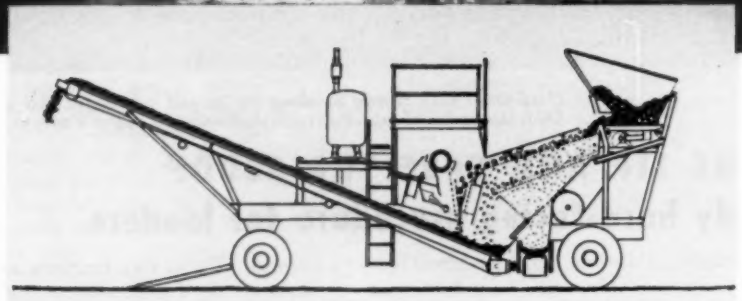
Cedarapids Built by IOWA

SINGLE PASS

PORTABLE CRUSHING AND SCREENING PLANT



- MOST PRACTICAL DESIGN
- SIMPLEST OPERATION
- LOWEST MAINTENANCE COSTS
- PRODUCES TWO SIZES



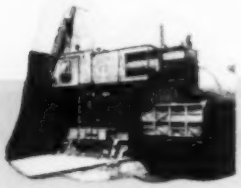
Here's the most practical Single Pass Plant available! Just check these improved features for convenience and economy . . . Hopper and feeder on the rear end let you *back up* to the nearest gravel bank and start producing . . . Simple design with few moving parts cuts maintenance costs. Replacement parts are inexpensive . . . *Two sizes of material can be produced!*

The improved Cedarapids Single Pass Plant pays for itself in money saved on county road maintenance work, small state contracts, base or blanket course jobs and dozens of others. Ask your Cedarapids distributor for details.

HERE'S HOW IT OPERATES

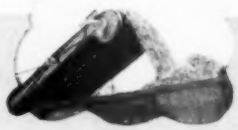
Pit run gravel or rock is fed into the hopper where boulders and oversize rock are scalped off by the grizzly. Material in the hopper is carried by the feeder to vibrating screen for sizing. Fines and sand pass through both screen decks and fall into the side sand delivery conveyor. Material passing through the top deck is chuted to the first delivery conveyor. Oversize off the top deck of the screen passes through the Jaw Crusher and the crushed material is discharged onto the delivery conveyor. This plant features *sand elimination* and also *blending* the desired amount of sand into the finished product by proper position of a flop gate giving a high quality end product. This makes an aggregate that packs and binds satisfactorily. When desired all material can be discharged on the front delivery conveyor by means of flop gate.

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U. S. A.



Master Bituminous Mixing Plant

Double Impeller Impact Breaker



Materized Head Pulley

Model G60 6000-lb. Bituminous Mixing Plant

Lime Association Operating Men Meet In Milwaukee

• Processing, personnel relations, and equipment stressed in papers at National Lime Association meetings. Field trips taken to plants of machinery manufacturers and lime producers

THERE WERE 113 REPRESENTING 30 DIFFERENT LIME COMPANIES present at the Operating Meeting of the National Lime Association held September 20-22 at Milwaukee, Wis. This was a different type of meeting than any of the other annual operating meetings, but was one that was well planned and which had excellent papers and discussion.

One unusual feature was that an entire day was scheduled for an inspection tour of the Allis-Chalmers Co. and Nordberg Manufacturing Co. plants. A second innovation was a two-day post-meeting tour of lime plants. The trip to the equipment manufacturing plants was made by chartered bus on the first day of the meeting. The Nordberg plant and the Allis-Chalmers process laboratories were visited in the morning and, following a luncheon at the Allis-Chalmers Club House, there was a tour of the company's plant. Both companies provided guides, and small groups were conducted through the plants so that each could have an opportunity to discuss processing equipment with qualified company personnel. The evening concluded with a smorgasbord dinner as guests of the Pabst Blue Ribbon Brewery.

Clarence LaLiberte, Cutler-Magner Co., Duluth, Minn., presided for the Tuesday morning meeting which covered papers on lime processing. Job instruction, industrial safety and the presentation of safety awards were the subjects of the afternoon personnel relations session under the chairmanship of Jesse J. Jacobsen, Limestone Products Co., Menominee, Mich. A cocktail party and dinner that evening featured an address, "Our Most Valuable Assets," by Charles G. Arps of Allis-Chalmers.

Lime plant equipment was covered in papers at the Wednesday morning session under the chairmanship of V. Fred Nast, Jr., The Western Lime and Cement Co., Milwaukee, Wis. The afternoon was set aside either for visits with Milwaukee equipment manufacturers or attendance at the Milwaukee-Cincinnati major league baseball game.

The post-meeting tour of lime plants started Thursday morning via automobile to Manitowoc, Wis., for inspection of the facilities of the Manitowoc Shipbuilding Corp. Following luncheon, inspection was made of the Rockwell Lime Co. operations after which President Michael Brisch and Mrs. Brisch of Rockwell Lime Co. were hosts to the group at their home followed by a dinner at the Lakeside Country Club. That evening, the party left by carferry for an overnight trip across Lake Michigan to Ludington, Mich., for a tour of The Dow Chemical Co. lime plant, after which the return trip was made by carferry to Milwaukee.

Michael Brisch was chairman of the Operating Division for this meeting and Clarence Stielstra was program chairman. Others active in making arrangements were Jesse Jacobsen, Fred Nast, Jr., and Clarence LaLiberte.

Kennedy Ellsworth, U. S. Lime Products Corp., Los Angeles, Calif., is chairman of the Operating Division for the 1955 meeting and D. M. Kerr, Kaiser Aluminum & Chemical Corp., Salinas, Calif., is program chairman. The meeting will be held at the same time as the annual N.L.A. convention, October 19-21, at Delmonte Lodge, Pebble Beach, Calif.

The meeting sessions were opened by Michael Brisch, chairman of the Operating Division, who outlined the program and welcomed all in attendance.

Kent Jander, chemical engineer, N.L.A., presented 1000-day safety awards. Here, K. V. White, assistant superintendent, Ash Grove Lime & Portland Cement Co., Springfield, Mo., (left) receives one of the awards

Vertical Kilns

A paper, "High Production Vertical Lime Kilns," by Robert S. Adams, plant manager of the Beachville, Ont., Canada, plant of Gypsum, Lime and Alabastine, Canada, Ltd., covered progress made in the production of lime in kilns at that plant. Production from the four original kilns of 57 sq. ft. shaft area has been brought up to an average of 90-95 tons of lime per day each. Mr. Adams detailed the changes which raised the capacity from 55 tons per kiln per day in 1939.

Two of the kilns were built in 1939 to be fired by natural gas through gas ports on each side of internal flues and through ports in the sidewalls. Each cooler was divided into four sections by a crosswall at right angles to the internal flue. There was a distance of 37 ft. between the gas ports and an offtake duct connected to a fan rated at 12,000 c.f.m., 6-in. s.p., 600 deg. F. A storage zone for stone sufficient for 8-hr. production was superimposed on top of this duct.

In 1940, a 10-ft. automatic gas producer was installed, because the natural gas supply was cut off and a third kiln of identical design was in-

L. N. Carmouche, Dow Chemical Co., Ludington, Mich., presenting safety trophy to C. J. Jorgensen, Marblehead Lime Co., Chicago, Ill., left

stalled. Production was gradually increased up to 70-75 tons per day per kiln as experience was gained, through the 1940-1945 period, and in 1945 the fourth kiln with gas producer was installed.

To insure stone supply, a new stone screening plant was designed with storage silos sufficient to operate the four kilns and also a small stone kiln built at that time, for 24-36 hr. Three 150-ton cooling bins were provided for cooling the lime from the four original kilns.

The biggest gains were achieved in the 1949-1954 period and the reasons were summarized for the four original kilns. At first the new stone plant provided 6- x 10-, 4- x 6-, and 2- x 4-in. stone sizes. The large size was used in two kilns, the intermediate size in two and the smallest size in the small stone kiln. The largest size was discarded, as work progressed, and 4- x 6-in. stone is now burned in all four kilns. Better draft and less channeling with reduced core resulted from rescreening fines out of the stone while loading the kiln car.

Instruments were installed to maintain a constant fuel ratio, the requirement roughly being 4 lb. of air per lb. of coal. A maximum of 3 percent CO_2 in the blast air was established and it is held at 2.5 percent. This is checked every hour, as is the fire bed, ash bed and coal bed. Gas temperature at the producer is held at 1500 deg. F. Should the producer gas approach 3 percent CO_2, checks are made to stop blowholes through the fire bed or excess air passing up the producer walls.

The problem of turbulency and gas mixture was solved to greatly improve production and fuel ratios. In the four kilns, nearly all the air for combustion came up through the coolers where it was preheated and ready to combine with CO. Resistance was high in the cooler due to the smaller pieces of stone, and spalling and breakage of lime, which caused air to flow up the walls of the internal flue and the side walls with resultant wastage of CO. As a solution, an offtake duct was built in the lower part of each internal flue about half way between the gas ports and the bottom of the cooler, the hot air was pulled out with an exhaust fan and blasted into both ends of the air duct on top of the internal flue and through slots over the gas ports. Use of about 65 percent of this hot air at 400-500 deg. F. gave a very turbulent gas-air mixture. It is controlled by dampers.

By keeping the producer gas temperature at 1500 deg. F., using hot injected air and highly heated air coming up through the cooler, combustion temperature was greatly increased as was production. Draft fan capacity had to be about doubled.

Times between draws have been varied and continuous drawing was even tried but was not adaptable to larger stone sizes. Since 1950, the period of draw has been continually decreased and, now, the kilns are drawn every 25 min.

Similarly, a number of changes were made in the small stone kiln to improve its performance. Its shaft area was enlarged to accommodate two internal flues. The offtake duct was set 6 ft. lower than for the other kilns because of the greater resistance through the small stone. The cooler was divided into six sections and six Syntron vibrators installed for drawing.

Stone size was cut from 2 x 4 in. to 2 x 3½ in. to reduce core and later to 2¼ x 3¼ in., with rescreening over a vibrating grizzly before filling the kiln car. Certain flue changes were made and other revisions to improve turbulence. The kiln is drawn as close to continuously as is practical, and the Syntron feeders are controlled by rheostat and timers so that the kiln can be drawn at intervals or a small quantity at so many seconds per minute. Present practice is to draw each hopper 8 sec. every minute. The kiln is producing 180 tons of lime a day and has a shaft area of 87 sq. ft. The limestone is very pure and can be burned at high temperature in a short burning zone.

Rotary Kilns

One of the outstanding papers was a very comprehensive and technical paper by Victor J. Azbe, Azbe Corp., St. Louis, Mo., which was the first that he has presented on the subject of rotary kilns. The paper was entitled "The Rotary Kiln — Its Performance, Evaluation and Development" and summarized Mr. Azbe's intensive and searching study of the rotary kiln in evaluating its performance and determining how its efficiency may be substantially improved.

The paper is far too exhaustive to abstract within the permissible space for this report of the operating meeting and was profusely illustrated with engineering diagrams and graphs and charts. It is must reading and was preprinted by the National Lime Association for limited distribution. It will be published in full later in ROCK PRODUCTS.

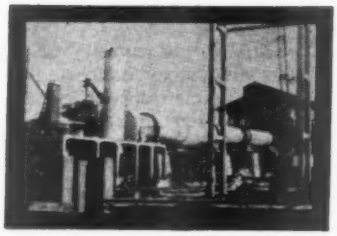
Throughout the paper, the author rationalizes on the shortcomings of the rotary kiln and expands on the findings which led to his being granted a U. S. patent on the rotary kiln.

The claims granted in patent No. 2,653,809, Serial No. 106,376, on September 29, 1953, are as follows:

"1. In a kiln, the combination of a rotary primary calcining drum sloping from a combination material inlet and gas outlet to a combination material outlet and fuel inlet, means at the lower end of the drum adapted to drop calcined material into several different streams of partially calcined material, a stationary vertical shaft located at the lower end of the drum having means to determine said streams and having an upper hood enveloping the material outlet and the fuel inlet, said shaft having separate lower compartments adapted respectively to receive the different streams of material for further and individual secondary calcining and cooling, means for withdrawing individual streams of material from the individual compartments, means for introducing cooling air to the lower ends of said compartments, and means for extracting air from intermediate points of said compartments to establish a cooling zone and reintroducing said air into said hood whereby self-calcination may continue in the upper portions of said compartments, the gaseous product of calcina-

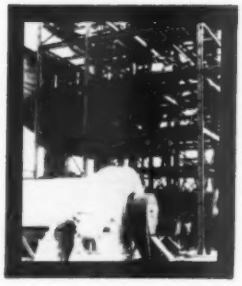
KENNEDY MACHINERY AND EQUIPMENT

TYPICAL KENNEDY INSTALLATIONS...



MOZAMBIQUE:
KVS 9' x 11' x 200' kiln and cooler.

Italcementi . . .
Calusco, Italy
One, of two complete KVS crushing plants for Calusco, located at separate quarries.



MOZAMBIQUE:
KVS Wet mill and classifiers.

PROVIDES NEW SOLUTIONS TO OLD PROBLEMS . . .

Geared to Serve You Best!

Throughout the world, for over half a century, leading cement, lime and mining plants selected KENNEDY machinery for its proven economy and its famous outstanding quality.

From the drafting boards, through foundry and machine shops to *installation*, every piece of KVS equipment is designed and manufactured to give years of continuous low cost service under the most severe operating conditions.

Consult us on your crushing, mining, cement or lime manufacturing problems—KVS has the "know-how" and experience to provide the right answer. Our sales-engineering department is available for consultation anywhere in the world.

KENNEDY PRODUCTS

• Gyratory Crushers • Swing Jaw Crushers • Slugger Rolls
• Ball Mills • Vibrating Screens • Rock Feeders • Air Swept Tube Mills
• Preheaters, Deheaters • Coolers, Dryers
• Fans, Blowers • Hoists, Conveyors • Dust Collectors
• Classifiers • Pneumatic Transport System
• Complete Cement Plants • Waste Heat Boilers
• Pulverized Coal Firing Systems • Rotary Kilns

IT COSTS LESS . . . TO OWN THE BEST

SEND FOR BULLETINS . . .

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D. M. Kerr of Kaiser Aluminum & Chemical Corp., left, presented safety trophy by L. N. Carmouche

tion in said upper portions of the compartments and by-passed air and also fuel from said fuel inlet passing through the hood into said drum for primary tempered calcination in the drum in the presence of combustion of fuel.

"2. A kiln made according to claim 1 including means for individually controlling said self-calcination in said compartments.

"3. A kiln comprising a sloping rotary drum of constant diameter throughout for down-flowing material from an upper open end to a lower open end and for upflowing gases from the lower to the upper end, means dividing only a mid-portion of the drum into radially disposed sectors, the ends of which sectors are substantially spaced from the respective ends of the drum to provide unobstructed endwise drum lengths, a burner nozzle adjacent the lower end of the drum adapted to inject a combustible mixture into said lower end, the distance from said lower end of the drum to one end of the dividing means being substantial and sufficient to allow thorough mixing of said combustible mixture without interference from any sectors, in order to provide for efficient carburetion, the lengths of said sectors being sufficient to effect substantial calcination, the unobstructed drum length from the other ends of said sectors to the upper open end of the drum being sufficient to effect a substantial preheating of material approaching the sectors.

"4. A kiln comprising a rotary drum having an upper combined material inlet and gas outlet, a dust chamber enclosing said outlet, a rock container in the dust chamber having a rock inlet from the outside and a rock outlet pipe leading into said drum, gas passages in the wall of the rock chamber for admitting gas from the dust chamber into the rock container independently of said rock outlet to the drum, whereby a substantial amount of gas may enter the rock container to pass through the rock to settle dust from the entering gas and to preheat the rock, said rock container having an outlet for said gas.

"5. A kiln made according to claim 4, wherein said rock outlet pipe leading to the drum is movable in a manner to adjust the position of its outlet relative to the inside bottom of the drum.

"6. A kiln made according to claim 4, wherein said gas passages consist of louvers in the rock container and wherein said rock container is of downwardly tapered form containing the louvers, and a spreader in the container adapted to spread rock over the louvers in its passage to said outlet pipe.

"7. In a kiln, a dust chamber having an opening, a rotary calcining drum having an end rotary in said opening and introducing hot gases into the dust chamber, a peripheral enclosure around said opening, circular running sealing means between said peripheral enclosure and the drum and axially spaced from said opening, and means other than said opening for drawing and leading off hot gases from said peripheral enclosure, hot gases being supplied to the enclosure by outward flow through said opening, whereby infiltration of cold outside air to dust chamber is positively prevented."

New Non-Pressure Hydrator

The new Kennedy non-pressure hydrator for calcitic and dolomitic lime was described by Maurice Shafer, assistant to the president, Kennedy-Van Saun Manufacturing and Engineering Corp., New York, N. Y.

A principal objective in development of this hydrator was to design equipment for the production of Type "S" hydrate which would not require steam pressure and yet hydrate all the magnesia in dolomitic limes.

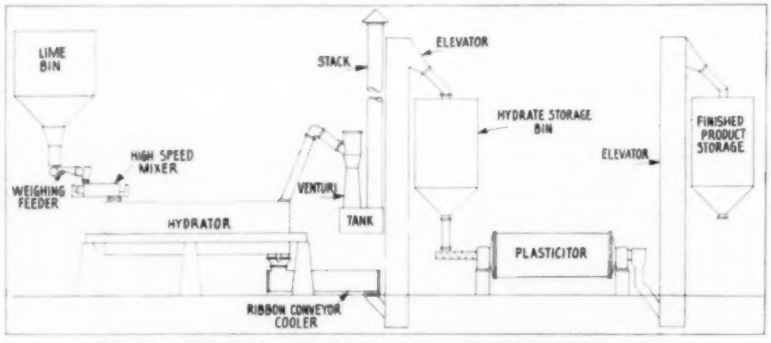
The three principal steps required in hydrating lime — mixing, ageing, and cooling and drying — are each performed in a separate piece of equipment in the Kennedy system which consists of a mixer, seasoner and cooler.

The mixer portion consists of a small, high-speed mixer designed for complete and intimate mixing of the quicklime and water within 2-5 sec. Quicklime is fed into one end of the mixer by a Poidometer belt to control the rate of feed. Water is metered by a Rotometer and is sprayed into the mixer through a pipe which may be positioned longitudinally in the mixer according to the activity of the lime.

Should the quicklime be a little slow reacting, the point of addition of the water may be advanced toward the feed end of the mixer in order that hydration may be just started as the mixture of quicklime and water leaves the mixer and enters the seasoner. If the lime be very active, the addition point is nearer the discharge end of the mixer.

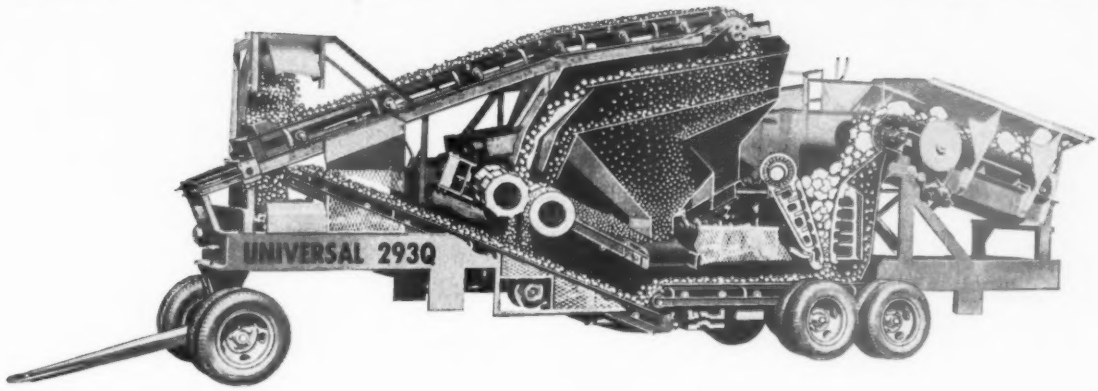
The mixer discharges through a straight drop into the end of the seasoner. The exhaust at the far end of the seasoner is controlled so that a trace of steam is permitted to work

(Continued on page 96)



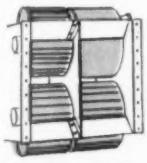
Elevation drawing showing details of non-pressure hydrating system

take 45 seconds to read this and you'll know why Universal's 293Q is your industry's finest crushing plant



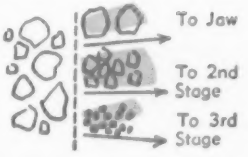
Universal 293Q TwinDual Pacemaker — two plants in one. Requires only one operator. For top capacity in rock and gravel. Completely portable.

Universal gives you three full stages of crushing in a complete portable plant. There are actually 3 crushers in this exclusive 293Q Pacemaker. The jaw and two complete crushers in the TwinDual rolls (4 rolls — 2 sets mounted side by side on common shafts). Each is fed separately. No material enters any crusher unless crushing by that stage is required; in other words, a closed circuit after each crushing operation.


TwinDual Rolls

What this means! With 2 stages of reduction in the TwinDual roll crusher, the jaw is no longer a bottleneck . . . the discharge opening can be set up to 100% wider. Production is greatly increased — less jaw and roll wear — longer crusher life — less maintenance . . . because no crusher is burdened with over or undersize material.

9 big reasons why the 293Q is your industry's finest plant



1. TwinDual rolls permit up to 7 to 1 reduction ratio with 80% increase in capacity over a conventional roll crusher.
2. High roll reduction ratio doubles jaw capacity and gives better angle of nip.
3. Three separate stages of reduction in one portable plant; 1st stage — jaw crusher. 2nd stage — wide opening section of TwinDual roll crusher. 3rd stage — narrow opening section of TwinDual roll crusher.
4. High percentage of finish produced in each stage. 26% of material from jaw is finished and never enters another crushing stage. 53% of finish from second stage and 85% finish from third stage. Only 15% is again recirculated for crushing.
5. Here's the plant for rock or gravel. Large feed opening jaw handles large boulders in gravel pits.
6. Skid mounted jaw and feeder permits plant to meet highway weight limitations. Easy to move.
7. Only one plant to move. One power unit to service.
8. Feeder interchangeable with scalper screen for gravel operation.
9. Operators report up to 200 T.P.H. with 100% crush and 300 T.P.H. and over in gravel with 25% crush.

This is only part of the 293Q story. This plant is loaded with profit-making features to help you beat competition. Get the facts from your Universal distributor or write to Universal Engineering Corporation.

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In Cedar Rapids, Iowa since 1906

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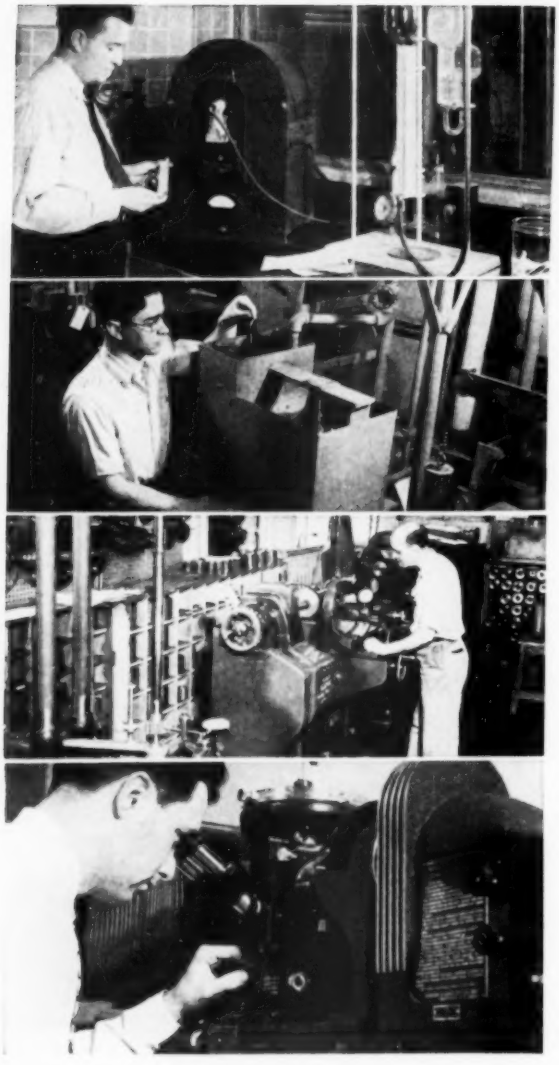
Good Gear Performance is No Accident



APPROVED IN THE LAB

From design through production, Allis-Chalmers engineers know their gears inside and out. Here are a few of the modern laboratory tests and inspection techniques by which their quality is controlled:

Carbon Content Test

With this apparatus, Allis-Chalmers engineers can determine the carbon content to within .01 percent. Steel must have correct carbon content to insure heat-treating to proper strength and hardness.

Quench Test

To help insure complete control over the quality of finished gears, all steel must meet specified hardening characteristics, determined here by the "End Quench Hardenability Test."

Dimension Test

Cutting tools used to make the gears, as well as the gears themselves, are measured in the gear laboratory. With this precise dimension control, Allis-Chalmers can mass-produce gears that are correct to 1/10,000 of an inch.

Metal Grain Test

Sections cut from finished gears are examined under metallurgical microscopes which magnify from 10 to 2,000 times. This test gives assurance of proper and uniform quality of grain structures in hardened gears.

PROVED IN THE FIELD

The final and most important test for any gear is its performance under actual job conditions. In Allis-Chalmers tractors, motor graders and Motor Scrapers, the quality of their gears is proved by long, efficient service on the toughest earth-moving jobs.

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TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Eastern Traprock Quarry reports:

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Shot after shot, you're sure of good breakage and safer operations with Du Pont "Nitramon" ammonium nitrate blasting agent. Here's another example: a 97,600-lb. coyote blast at a large eastern traprock quarry. Operators were able to handle and load charges quickly, easily and safely, as "Nitramon" is non-headache-producing and permits use of electric lighting in the tunnel.

Nearly 300,000 tons of well-broken rock was the result (see photo at right), and it's typical of the excellent fragmentation being obtained. "Nitramon" has greatly reduced the amount of secondary blasting required—and men work with the assurance that it cannot be detonated by fire, friction or sudden shock.

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Lime Operating Meeting

(Continued from page 92)

back at this point, thereby insuring the absence of air in the seasoner.

The Seasoner consists of a horizontal cylinder with a rotating shaft carrying cutting blades to break up any lumps. Size of the cylinder is determined by the desired tonnage and the required retention time. It is provided

One of the four ROCK PRODUCTS safety trophies awarded at the meeting. This award was to J. E. Baker Co., Thomasville, Penn. plant

with an oil jacket which serves several purposes. The hydrated lime overflows at the discharge end of the cylinder over an adjustable baffle to the cooler and the steam is exhausted at the same end. In a commercial installation, a 6- x 20-ft. cylinder is hydrating 6 t.p.h. of rotary kiln dolomitic quicklime to Type "S" specifications, but could produce 10-12 tons per hr.

The oil jacket permits circulating preheated oil prior to starting hydration which permits hydration to begin with the full ratio of water to quicklime. It also permits the shutdown of the equipment under load and subsequent starting up without evacuation. The principal advantage is that, while operating, the jacket transfers some heat from the initial portion of the Seasoner where there may be an excessive amount to the final portion where the heat generation may be deficient. This is of importance, said Mr. Shafer, in the hydration of dolomitic lime, in order to complete the hydration of all the magnesia. There is no loss by heat radiation.

Hydrate leaving the Seasoner discharges to the cooler which is a ribbon conveyor, where air flows countercurrent to the hydrate, and drys and cools it. When the hydrate is dry, it flows along the bottom of the conveyor which minimizes the dust problem. Air and steam are passed to an exhauster and to a wet scrubber, the hot milk of lime being used for hydration water.

Draft for the removal of steam from the hydrator and air from the cooler is accomplished by use of a venturi-type exhauster. Fresh heated water in metered quantity is delivered to the venturi, creating the draft and further preheating the water prior to its introduction into the high speed mixer.

Electric motors required for a 6-ton per hr. hydrator are 15 hp. for the mixer, 5 hp. for the Seasoner, 3 hp. for the cooler, 25 hp. for the water pump and ¾ hp. for the oil circulating pump. Electric heaters are required to heat the oil.

After cooling, the hydrate is put through a Plasticitor which is a 5- x 18-ft. rotating drum using 10-12 tons of small rod-like media. It is divided into four chambers so that the charge of media and the hydrate are divided. Rotation results in a sliding or rubbing motion of the media over the hydrate.

Job Instruction

"Making Job Instruction More Effective" was the title of an excellent talk before the personnel relations session, by Robert M. Rompf, assistant professor, Department of Business and Industry, Michigan State College. The essence of his talk was that recognition must be given to the need that all management personnel be teachers of jobs as well as supervisors. It was stressed that more effective job instruction is the real solution in the elimination of most of the problems concerned with production.

Job instruction is a process that must go on every day in the supervision of people, according to the professor. Among the qualifications for those in management in order to improve job instruction, he mentioned the need of knowledge and skill on the part of management, interest in helping others to learn, and understanding of how people learn, proper presentation and followup. The more the knowledge of the supervisor, the greater is the need for planning the teaching of workers. The worker must be made to recognize the importance of what he is learning to do and be made to recognize the advantages to him in learning how to do a job properly.

NATIONAL LIME ASSOCIATION
SAFETY TROPHY 1953
CLASS B COMPETITION
WON BY THE STANDARD LIME & STONE CO.
BAKERTON, W. VIRGINIA, PLANT
AWARDED BY ROCK PRODUCTS

Another of the four ROCK PRODUCTS safety trophies went to The Standard Lime & Stone Co., Bakerton, W. Va. plant

Industrial Safety

Considerable interest was shown in a talk, "Industrial Safety in Wisconsin" by W. J. Kilpatrick, Supervisor of Factory Inspection of the Industrial Commission of Wisconsin.

The Wisconsin commission was set up in 1911 and was the first state industrial commission to be established. Since 1911, Mr. Kilpatrick said that more than one billion dollars have been paid out for industrial injuries. The commission was set up to provide safe working places, and it functions through appointed committees representing management, labor and insurance carriers in the revision of and writing of codes.

Among penalties imposed are a 15 percent increase in the compensation rate if a concern be in violation of standards such as improper guarding of a moving belt for example. If an employe be guilty of wilful violation of a safety standard he may have his compensation reduced by 15 percent. In such cases there is no way that he can sue on the outside, the rulings of the Commission functioning as law.

There are 55,000 separate employers in the state and their operations are inspected at least every two years. Certificates of inspection are issued and the needs to bring conditions up to standard are listed and orders given to correct sub-standard conditions. Reasonable time is given for compliance and such plants are then reinspected.

The Commission has 26 different codes and issues general orders on safety, covering machinery guards, dust, sanitation, explosives, use of goggles, the operation of quarries and others applicable to the lime industry. Ear guards are specified for use in high noise level areas which would include crushers and dryers and the Commission is actively studying the problem of noise and its measurement.

It was in Wisconsin that a worker in a drop forge plant was paid compensation for alleged loss of hearing even though there was no time lost from work, which is one of the cases establishing a precedent of national interest. On July 1, 1953, a temporary law was passed requiring that all future loss of hearing cases be decided on a wage-loss basis. A number of cases were pending before that date, however, and there will be awards granted on some of them.

Safety

Following Mr. Kilpatrick's talk, safety awards were presented by L. N. Carmouche, plant manager, The Dow Chemical Co., Ludington, Mich., and Kent Jander, N.L.A.

(Continued on page 103)

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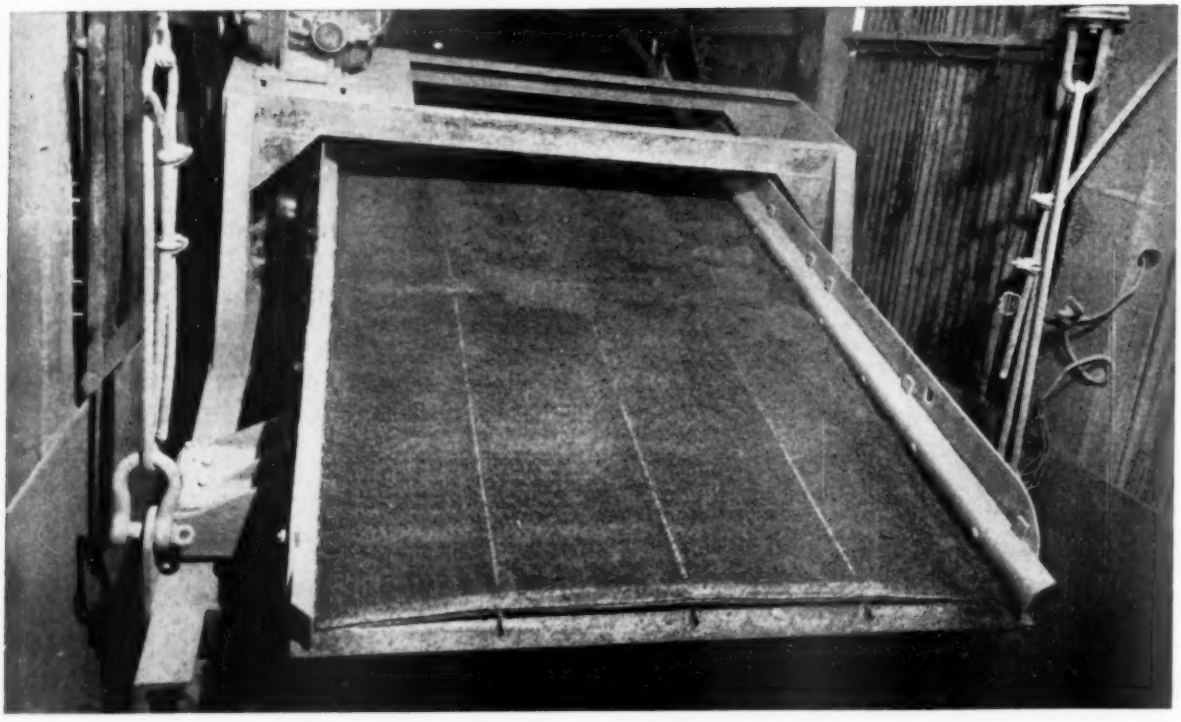

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INFORMATION

You can obtain catalogs listed on these pages by merely checking and mailing the coupon below

TO HELP YOU MEET TODAY'S PROBLEMS AND TO MAKE PLANS FOR TOMORROW

1 AIR COMPRESSOR—Le Roi Co. has released a two-page bulletin on the 105 c.f.m. Utility air compressor. Illustrations, specifications, and tool capacities are included.

2 AUTOMATIC BOILER—Boiler Engineering & Supply Co., Inc. has announced Bulletin BE-4, describing the operation and advantages of the Continental automatic boiler's "spinning gas technique." A cutaway view shows boiler construction, and the method of injecting air.

3 BLAST HOLE DRILL—Ingersoll-Rand Co. has released Form 4153, describing and illustrating the QM-2 Quarrymaster blast hole drill for rotary or percussion drilling. Typical application photographs, a list of accessories, dimensions, and specifications are included.

4 BLOCK LIFT—Waco Manufacturing Co. has issued a two-page catalog sheet describing and illustrating the Waco block-lift, both single and tandem types. Operation and application data and advantages are included.

5 CHAIN DRIVES—Morse Chain Co. has brought out a folder, No. 72-54, detailing installation and maintenance procedures for Hy-Vol high-speed, heavy-duty chain drives for 50 to 5000-hp. drive applications. The folder is of water and oil-proof plastic material, and includes line drawings and disassembly procedures.

6 CINDER BLOCK—The Jeffrey Manufacturing Co. has announced Bulletin 672, describing and illustrating the "Strait-Flo" cinder preparation system for cinder concrete block. The six units comprising the system are described and illustrated, and a typical installation is shown.

7 CONCRETE BLOCK—American Webco Corp. has issued a bulletin introducing "Webco" multiple web concrete block. Cross-sectional drawings of typical wall construction, photographs of typical building projects, and specifications are given.

8 CONCRETE EXPRESSWAYS—The Portland Cement Association has published a booklet entitled "Concrete Expressways," illustrating and describing various modern highways in the United States. The advantages of concrete pavement are also discussed.

9 CRANE SHOVEL—Bay City Shovels, Inc. has released a 16-page illustrated catalog describing the design and construction features of its 1½-cu. yd. crane-shovel. Machinery and parts illustrations are included.

10 CRAWLER TRACTORS—Caterpillar Tractor Co. has issued Form D438 giving a brief history of crawler tractor manufacturing over the last 50 years. Illustrations show improvements.

11 CUPOLA OPERATIONS—American Foundrymen's Society, 616 S. Michigan Ave., Chicago, Ill., has published the second edition of a 332-page technical book entitled "The Cupola and Its Operation," containing 328 illustrations, 54 tables, and a bibliography with 702 references. Chapters are included on refractories, principles of combustion and metallurgy. The book is available to non-members from the society at the above address for $9.50, and to members for $6.00.

12 ELECTRIC SHOVEL—Harnischfeger Corp., Large Excavator Div., has published an eight-page bulletin, No. X-162, introducing its P & H Model 1055-E all-electric shovel.

13 ENGINE-DRIVEN WELDERS—The Lincoln Electric Co. has issued Bulletin 1337, describing and illustrating Shield-Arc engine-driven welders. Construction details and specifications are given.

14 FINE SAND RECOVERY—Smith Engineering Works has released Bulletin 285 describing the 24-in. sand DorrClone for fine sand recovery. Engineering drawings, capacities, dimensions and specifications are included.

15 HAND LIFT PALLET TRUCKS—The Yale & Towne Manufacturing Co. has issued a 12-page brochure, No. P-673B, describing and illustrating Yale pallet hand lift trucks. Included are typical application photographs, different pallet types and designs, cutaway photographs showing operation of both hydraulic and mechanical lifting mechanisms, and specifications.

16 HEAVY DUTY GEAR LUBRICATION—The Texas Co. has published Vol. 40 No. 6 of "Lubrication," featuring an article on heavy duty gears; giving data on lubrication recommendations, performance, and application.

17 HYDRAULIC CLASSIFIER — The Dorr Co. has brought out Bulletin 2342, describing construction, operation and advantages of the Dorrco Jet Sizer, a hindered settling hydraulic classifier. Line drawings and photographs are included.

18 INDUSTRIAL PRODUCTS — American Brake Shoe Co. has brought out a 48-page catalog entitled "Your Guide to Brake Shoe Products," containing sections on ferrous and non-ferrous castings, bearing materials, sintered metals, steel forgings, welding products, air compressors, industrial pumps, dredge pumps and railroad products.

19 INDUSTRIAL RELAYS—Automatic Electric Sales Corp. has released data sheets No. 1801 and No. 1805, giving detailed descriptions of a line of industrial relays. Dimensional drawings, wiring diagrams and specifications are given for plug-mounted Classes A, B, F, S, and Z relays.

20 IRON CASTINGS—The International Nickel Co., Inc. has issued a 36-page "Glossary of Terms for Producers and Users of Iron Castings," which explains over 150 technical terms concerning ferrous and non-ferrous castings.

21 KILN DOORS—Moore Dry Kiln Co. has announced a bulletin, commemorating its 75th Anniversary, No. 5403, which gives a partial listing of its products. Included is a sheet describing and illustrating metal-insulated kiln doors.

22 MANUFACTURING ACTIVITIES—Blaw-Knox Co. has released a 50-page brochure entitled "This is Blaw-Knox," illustrating the diversified manufacturing activities of the company. Major departmental operations of its 11 applications are also included in the 50-page brochure.

23 MINING EQUIPMENT—Allis-Chalmers Manufacturing Co. has brought out Booklet MS-977, entitled "Modern Mining Methods," giving a pictorial review of its line of industrial equipment as applied by the mining industry. Action photos of crawler tractors, motor and pulley scrapers, motor graders, motor wagons, and power units are included in the booklet.

24 MOBILE ELECTRIC PLANTS—D. W. Onan & Sons Inc. has brought out "Power Points Digest," Vol. 10, No. 4, describing its various mobile electric generating plants. Typical applications are also discussed in the power digest.

25 MOTOR SHOVELS, CRANES—Thew Shovel Co. has issued a 12-page catalog illustrating and describing the Lorain "42 Series." A section is devoted to each of the Moto-Shovel, Moto-Hoe, Moto-Clamshell, and Moto-Dragline models, with another section giving emphasis to the crane boom and its accessory equipment.

26 OXYGEN MEASUREMENT—Minneapolis-Honeywell Regulator Co., Industrial Div., describes the application and operation of the A. O. Beckman Model F-3 oxygen analyzer and the Brown ElectroniK recorder for measurement of oxygen in industrial processes in its Data Sheet No. 10.15-11.

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27 **PACKAGE BOILER CONTROLS**—The Hays Corp. has published Bulletin 54-1088-239, giving specifications for fully automatic, electric metering type packaged control for shop assembled boilers. A schematic drawing illustrating a typical system for a combination oil and gas fired boiler is also included in the publication.

28 **PACKAGED AUTOMATIC BOILERS**—Orr & Sembower, Inc. has issued Bulletin 1223, describing and illustrating two types of Powermaster packaged automatic boilers in 17 sizes from 15 to 500 hp. for steam processing as well as steam and hot water heating service. Constructional and operational advantages are also described and illustrated in the Powermaster bulletin.

29 **PNEUMATIC CONVEYING** — Convair Corp., has issued Bulletin 105 on various pneumatic conveying systems, featuring diagrams of typical pneumatic conveying installations and layouts.

30 **PNEUMATIC HANDLING SYSTEMS**—Fuller Co. has released a 16-page bulletin, No. G-2, describing and illustrating bulk pneumatic handling systems. Also covered are the Fuller rotary compressor, clinker cooler, and kiln preheater. Advantages of the Airveyor and Airslide systems are also given, including application data.

31 **PORTABLE CRUSHER**—Iowa Manufacturing Co. has issued Bulletin SPP-3 explaining the principle of operation of the Single Pass Portable crushing plant and describing its features.

32 **PRESTRESSED CONCRETE SLABS**—The Flexicore Co., Inc. has published Bulletin 4-K, describing and illustrating Flexicore precast, prestressed concrete slabs and their applications. A load chart and line drawings are included.

33 **PROTECTIVE COATINGS**—Magic Chemical Co. has issued a condensed catalog on Magic-Vulc anti-abrasion and anti-corrosion protective coatings and their diversified industrial applications.

34 **PULLEY TYPE SEPARATORS**—Magnetic Engineering & Manufacturing Co. has released Catalog 602-4 describing and illustrating complete magnetic pulley type separators in both electro and permanent (non-electric) types. Weights, capacities and dimensions of the separators are also listed.

35 **RAKE AND SETTLING UNIT**—Denver Equipment Co. has released Bulletin T5-B5, describing and illustrating the Denver Spiral Rake Thickener, a mechanical rake and settling unit for the separation of solids from liquid. Drawings, photographs, dimensions, specifications and capacities of steel, wood and concrete thickener tanks are given. A suggested circuit equipped for thickening and filtering is shown in flowsheet study form.

36 **REAR-DUMP TRAILER**—Athey Products Corp. has issued Form PR-1014, describing and illustrating the Athey PR21 rear-dump trailer, its construction and specifications. The Cat DW21 tractor, for use with the trailer, is also described.

37 **RECONDITIONED MACHINERY**—Morse Bros. Machinery Co. has published Bulletin 541, listing and illustrating its line of reconditioned mining and milling machinery, and electrical, industrial and construction equipment. Specifications for the line of reconditioned machinery are also included.

38 **RETARDER**—The Parkersburg Rig & Reel Co. has released a bulletin describing and illustrating the Hydrotarder, a hydraulic retarder. An alignment chart, and design and operating data are included.

39 **ROCK BITS**—Manchester Bit Corp. has issued a brochure describing custom carbide insert rock bits. Specifications are given for the jackhammer, stoping, heavy drifter and wagon drill bit series. Special bits are also described in the brochure.

40 **SAFETY**—National Safety Council has announced employe training leaflets entitled "Accident Preventers." Cartoons are utilized to point out safe principles and practices on lifting, housekeeping, clothing and hand tools.

41 **SECTIONAL BELT CONVEYORS**—Stephens-Adamson Manufacturing Co. has announced Bulletin 1454 describing and illustrating Saco sectional belt conveyors. Conveyor components pre-engineered for assembly are listed.

42 **SHAFT MOUNTED DRIVES**—The Falk Corp. has issued Bulletin 7101, describing and illustrating shaft mounted drives. Selection tables, dimensions, and specifications are given. Typical applications are also listed.

43 **SLAG BLOCK**—The National Slag Association has issued a revised edition of its slag block manual, entitled "Slag Concrete Masonry Units." Data on the properties, selection, construction and uses of slag and slag-concrete masonry units are given. Photographs of typical masonry applications and tables are also included in the manual.

44 **SPEED CONTROLLER** — The Yale & Towne Manufacturing Co. describes the magnetic "Cam-O-Tractor," a speed controller designed to fit all makes of electric trucks, in Bulletin 1599. The method of operation is illustrated.

45 **STANDARD PRODUCTS**—Link-Belt Co. has issued a 340-page standard products catalog, No. 950, with several major classifications including chains and sprockets for conveying, elevating and power transmission. Tables of pre-engineered drives, and a listing of standard products for screw, belt and Flexmount conveyors and bucket elevators are included in the catalog.

46 **TRACTORS-SCRAPERS** — Allis-Chalmers Manufacturing Co., Tractor Div., has brought out a 16-page booklet entitled, "Allis-Chalmers Offers New Economy For—Villages, Townships, Counties, Cities, States, Federal." Action photographs illustrate year-round use of tractors, motor graders, motor and pull-type scrapers; and descriptions and illustrations of motor wagons and power units with matched allied attachments are also given.

47 **TRAILER**—Athey Products Corp. has issued a four-page booklet, describing the Universal trailer, its construction, features, specifications and applications. Illustrations are included.

48 **UNDERGROUND MINING EQUIPMENT**—Caterpillar Tractor Co. has issued Form D465, entitled "Underground Mining With Caterpillar," giving testimonials by mine owners and superintendents, as well as typical action photographs of track-type tractors, shovels, bull-dozers, motor graders, wheel tractors and engines.

49 **URANIUM DETECTOR**—United States Atomic Energy Commission has prepared a booklet entitled "Prospecting With a Counter," describing the use of radiation detection instruments in prospecting for uranium ores. Maintenance, operation and application data, and practical problems and limitations relating to the use of the radiation detection instruments are also given.

50 **V-BELTS**—T. B. Wood's Sons Co. has brought out a V-belt drive manual giving a listing of pre-engineered stock drive selection tables; design data; stock sheave and pulley specifications; as well as information on various V-belt designs.

51 **VIBRATING FEEDERS**—Syntron Co. has brought out a catalog sheet describing and illustrating fluid power vibratory feeders, Models HF-1, AF-1, and F-86. Trough sizes, dimensions, mounting data, and specifications are also included for the three models of fluid power vibratory feeders.

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Mining Congress Reveals Progress In Equipment and Processing

SAN FRANCISCO, CALIF., was host to the western division of the American Mining Congress with an exhibit and meetings at the Civic Auditorium on September 20 through 24. The show and programs were designed to interest the metal and non-metallic mining field, however, because of the magnitude and excellence of the exhibits, they are each year attracting all segments of industry interested in handling or moving earth materials. The enormous expense to the machinery manufacturers that exhibited at this year's show cannot be justified unless the term "non-metallic mining" is dropped and replaced by "industrial minerals" or "rock products," and even the large contracting industry could be included in some over-all phase, for the metal mining industry, without these satellites, is utterly incapable of buying enough equipment to write off such a show as justifiable. As an illustration; outside the main auditorium there were at least four, full - scale, ready - to - operate, rotary drills designed to drill large diameter holes. Inside was a fifth late model percussion drill designed for similar types of drilling and unless the industrial mineral producers, or the contractors buy some of these items, the western metal miner cannot alone carry the load.

The meeting was top heavy with subjects related to uranium. It was mouthed about as the "Hundred Million Dollar Industry." Yet the sand and gravel industry in California alone was stated to be valued at $45,000,000 last year. And, an important speaker on this subject was allowed exactly ten minutes to cover a subject that from a dollar standpoint ranks as 19 when compared to California's metal mining industry which rates a 3. In a similar vein, one large industrial mineral producer sent four representatives to the show mainly to hear a paper on lightweight aggregates. This able speaker, too, was allowed exactly ten minutes to cover the subject "Lightweight Aggregates of the West." "Manufactured" artificial lightweight aggregates in the West is a big and growing industry with five or more producing plants, the dollar production value of which might equal California's gold production, but it was hardly mentioned. Therefore, the capable speaker had to confine his remarks to a geological review. At this same session nine speakers on industrial minerals — so-called non-metallics, had to limit all their addresses to 90 min.

Outstanding Exhibit

Therefore, the dominant phase of this year's Mining Congress meeting, as far as the pushed-aside rock products and industrial minerals producer is concerned, was the exhibits. The exhibits were large, colorful, instructive and well diversified. Many new pieces of equipment that undoubtedly will find many uses in the rock processing field were shown for the first time. A great majority of the exhibitors had full scale equipment to show the visitors, and not just a booth with photographs and literature. There was probably twice as much equipment on display as any similar show in recent years. The meeting was well attended; probably a record-breaking registration.

Practically all sessions opened with a sound-tracked moving picture with educational features of interest to the industries. "The Drama of Portland Cement", sponsored by the Portland Cement Industry, was one, and we use it as an illustration. "Nevada and Its Natural Resources" by the United States Bureau of Mines was another. These "openers" add great interest and value to what often can be a dull session. Speakers were not confined to any particular walk of life, and some machinery representatives gave some of the most informative and instructive papers that were presented at the various meetings.

The opening sessions on Monday were introductory in their nature with many important speakers, mostly from the political walks of life. Labor and personnel problems and public relations were covered in one of the afternoon sessions. A simultaneous session covered "Geology and Exploration."

Non-Metallic Minerals

A session on Tuesday, devoted to "Non-Metallic Minerals," was presided over by Olaf P. Jenkins, Chief, California Division of Mines. The speakers and the subjects were as follows: "Introductory Review of Nonmetallics," Henry Mulryan, president, Sierra Talc & Clay Co., South Pasadena, Calif.; "New Uses for Phosphates," J. G. Miller, manager, Sales Development, Westvaco Minerals Products Div., Food Machinery & Chemical Corp., Newark, Calif.; "Cement Industry of the West Coast," Robert A. Kinzie, Jr., superintendent, Santa Cruz Portland Cement Co., Davenport, Calif.; "Lightweight Aggregates of the West," Charles W. Chesterman, associate mining geologist, California Division of Mines, San Francisco; "Concrete Aggregates in Northern California," Edward L. Howard, physical testing engineer, Pacific Coast Aggregates, Inc., Colma, Calif.; "Nonmetallic Minerals for the Chemical Industry of the West," Fred Lohse, assistant to vice-president, Kaiser Aluminum & Chemical Corp., Oakland, Calif.; "Ceramic Uses of Talc," Richard S. Lamar, research director, Sierra Talc & Clay Co., South Pasadena, Calif.; "Geology of Talc," Lauren A. Wright, California Division of Mines, Los Angeles; and "Olivine in Manufacture of Refractories," W. F. Rochow, assistant to president, Research and Development, Harbison-Walker Refractories Co., Pittsburgh, Penn.

Mr. Mulryan outlined the importance of the industrial minerals to our national economy, pointing out that in most cases the production of the industrial minerals far out-distances the metals. He said the economy might be showing soft spots but these soft spots are among the users of the metals or metallic minerals, but in the industrial and construction field the industrial mineral outlook was promising from all angles. He mentioned the use of bleaching clays in the same ratio as oil production and that industry is thriving. Talc is finding many uses for insulators and electronic devices, and at last the United States talc industry has broken into the cosmetic market by supplying a year-to-year quality material. He pointed out that there were three new diatomaceous earth processing plants in that industry and all were busy.

New Uses for Phosphates

Mr. Miller, in his 10 min. of alloted time gave a brief history of the phosphate industry although his paper was actually 16 typed pages (double spaced). He outlined former research work. He said the important use for phosphates up to 1930 was for fertilizers; lavening agents and food products

(all were ortho except one pyrophosphate product); metal coating compounds (all ortho phosphates); and water softening and detergents (all ortho phosphates). He said that last year 6,000,000 tons of phosphate material was treated by acidulation (sulphuric acid) for the fertilizer trade. Later uses for phosphate salts were for boiler water treatment and for use in drill "muds" as the addition of these phosphates enables the driller to maintain the right degree of viscosity which could be changed without changing the density. Analogous uses were to seal up leaky ponds, irrigation ditches when the phosphate salts were used as the dispersing agent, along with such clays as bentonite.

He told of the use of phosphate salts in the building of airways and highways where the phosphate salt aided compaction. The wet feeds to kilns in a cement plant can be pumped with less water by the use of phosphate salts. One newer development, the speaker mentioned, was the use of organic phosphate materials that are absorbed by the plants and render the plant juices toxic to insects and related pests. A phosphate salt is used by one large oil company in its gasoline to reduce spark plug fouling. He pointed out that the phosphate industry mined 12,000,000 tons in 1953, and the going market price was $4.50 a ton and up, depending on the phosphorous content of the rock. This industry alone has a total value from $50,000,000 to $60,000,000 yearly.

Robert E. Kinzie, Jr., gave a brief history of the cement industry in the West and of its economic development. The industry has grown rapidly during the last two decades with no end in sight. The speaker mentioned two new cement plants scheduled for construction in California. One at Mojave (California Portland Cement Co.) and one presumably near Fontana, Calif., where the Kaiser interests will use slag from their Fontana steel mills as a basic ingredient.

Mr. Chesterman's paper on lightweight aggregates outlined the geology of pumice, pumicite, perlite, volcanic cinders, and their growing importance.

E. L. Howard said that California's production of sand and gravel for 1953 was 53,000,000 tons with a value of $45,000,000. He told about sampling techniques, and the necessity for aggregates to meet tests for soundness and durability. The producer, he said, must cope with ever-changing conditions in his deposit and with constantly changing specifications. He showed some slides of typical sand and gravel operations in the West.

Lauren A. Wright said the talc deposits of California, which supply a large fraction of the U. S. talc output, lie in the desert region along the eastern border of the state. All but a small part of the talc in these deposits appears to have formed as an alteration of dolomite, but otherwise the talc deposits occur in three distinct geological settings.

He said that in the Inyo Mountains, the talc occurs largely in dolomite of Ordovician to Silurian age, is seemingly unrelated to exposed intrusive rocks, and formed in late Mesozoic or Tertiary time. These deposits have yielded most of the talc of steatite grade mined in California. In the southern Death Valley area, talc-tremolite bodies occur in a later pre-Cambrian dolomite member, and exists at or near the border of diabase sills of the same age. These deposits contain by far the largest reserves of paint and ceramic talcs in the state. Talc-tremolite bodies near Silver Lake in San Bernardino County occur in a sequence of earlier pre-Cambrian metasedimentary rocks and appear to be related in origin to bodies of granitic rock that have intimately invaded the metasedimentary rocks. This talc-tremolite rock has been used mostly as a wall tile ingredient.

Other sessions covered drilling and blasting, underground mining, milling and metallurgy, but were principally concerned with metallic mining.

Lime Operating Meeting

(Continued from page 96)

In presenting the safety awards to winning plants in the four categories of competition for 1953, Mr. Carmouche spoke briefly on the need for more stress on improving safety practices. He mentioned the humanitarian side of safety and also the matter of economics. Producers stand to gain financially, he said, if they get the job done themselves rather than, through failure, encourage state and federal government intervention which will be considered necessary in the event of failure to act by industry.

The trophies presented by Mr. Carmouche were awarded by ROCK PRODUCTS and will be given annually in the future. Being awarded for the first time, we briefly describe them and their manufacture. They are 1½ x 18- x 18-in. plaques made from hard, limestone slabs. The slabs were honed to resist moisture absorption, they are very dense and have a smooth finish to resist adhesion of dirt.

Photographs of the winning plants were used as a guide to reproducing pictures of the plants in color on the face of each plaque. Reproduction was by hand-line work, indicating the necessary details and suggesting sinkages into the material to secure part of the perspective.

D. M. Kerr, Kaiser Aluminum & Chemical Corp., Salinas, Calif., elected chairman for the 1955 meeting to be held in California

A rubber and glue masking stencil was placed over the entire surface, the line drawing was imprinted upon this material by use of carbon black and all the details were then stencilled. The outlines were cut into the plaque and the color elements applied with an air-gun or by hand. Then the masking was removed to reveal a reproduction of the subject plant in flat relief.

Winners of the trophies were, in Class A-1, the Natividad, Calif., plant of Kaiser Aluminum and Chemical Corp.; Class A-2, South Chicago plant of Marblehead Lime Co.; Class B, Thomasville, Penn., plant of The J. E. Baker Co.; and in Class C, the Bakerton, W. Va., plant of The Standard Lime and Stone Co.

Kent Jander presented two Certificates of Achievement to plants which have operated 1000 days continuously without lost-time accidents. They were very handsome framed certificates and each had a line reproduction of the honored plant. One was awarded the Springfield, Mo., plant of Ash Grove Lime and Portland Cement Co. which has operated since February 10, 1950, without lost-time accident; the second to the Luckey, Ohio, plant of National Gypsum Co. which has had a perfect record since July 6, 1950. There have been 17 winners of this award since its establishment.

Castable Refractories

Ray A. Witschey, A. P. Green Fire Brick Co., Mexico, Mo., in a paper "Monolithic Refractories in the Lime Industry" covered the use of refractories in general and outlined many applications in which castables could be used to advantage. His very comprehensive paper was illustrated with

(Continued on page 108)

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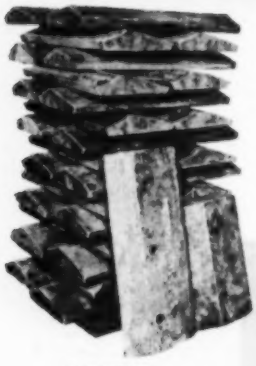

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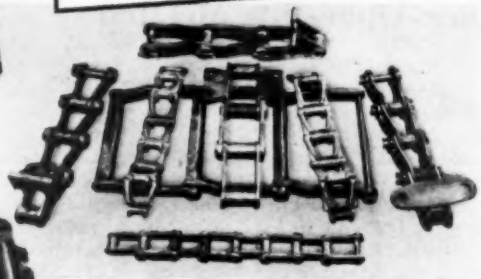

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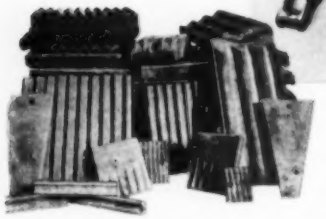

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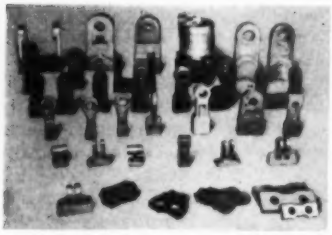

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Rocky's Notes

(Continued from page 49)

sentative, with management experience, if they are equally honest and conscientious, and selected with care, can do wonders in improving labor-management relations.

Those who haven't done so are urged to read the "Report of a Special Subcommittee to the Committee on Education and Labor, Pursuant to H. Res 115" — U. S. House of Representatives. The report is short (12 pp.), but it gives some typical examples of what is happening to union welfare funds in some of our metropolitan centers under the management of locals of the International Teamsters Union. It is quite obvious that there are devious ways for crooked union officials to appropriate funds, which on the surface appear to be legal if not ethical. With the kind of union official who embezzles or operates a racket, it is easier to deal, but eternal vigilance is necessary with the former kind — vigilance on the part of both union members and their employers, which forming a common bond, should make for better understanding between them.

Committee's Conclusions

The House of Representatives subcommittee did not come up with any specific recommendations for new legislation. It reported merely in favor of further study of the problem. Its conclusion read, in part: "The more urgent of these is the study of welfare funds. Existing law deals with these funds only in a superficial manner. Yet in recent years there has been a rapid growth in the many so-called 'fringe' benefits, including welfare and pension programs, which are products of collective bargaining. As their assets grow, there also grows the possibility of abuses connected with them.

"Experience has shown that in human affairs abuses are most prevalent when power is great and regulation slight. There is no reason to assume that history will record an exception to this pattern of human conduct by the employers, unions, and others connected with these funds and their administration.

"The employes and their families are the true beneficiaries for whose use these funds must be conserved. We do not believe the Congress possesses adequate data to justify legislative action in this field at the present time. We therefore believe that a prompt and detailed study of the whole problem should be undertaken."

Since many of our readers have a very vital interest in any such study and resulting legislation, we urge them to give their Congressmen and Sena-

tors the benefit of their experiences and their suggestions as to how to meet these problems. So far as the Teamsters International Union itself is concerned, there appears to be little prospect that much will soon be accomplished. According to the *Wall Street Journal*, Dave Beck, the head of the union declared, at the recent American Federation of Labor convention in Los Angeles, "that 'a constitutional amendment will be necessary to provide for international approval of the principles and procedures embodied in the welfare fund or plan.'

"Under the Teamsters' constitution, local unions normally have complete autonomy not only in their collective bargaining but in the handling of their financial affairs. Affiliation with the International Teamsters requires little more than that the local union pay stated dues to the international headquarters." And under the same constitution changes or amendments appear about as difficult to accomplish as changes in the Constitution of the United States.

That Beck's attitude is none too cooperative would appear from a news dispatch in the *Chicago Tribune* of September 28 quoting him as follows: "The congressional committee is conducting a political investigation," Beck shouted, "else why is it meeting on the eve of election? The object is to destroy the structure of welfare plans. How could frauds occur unless in collusion with management?"

Labor Relations

(Continued from page 51)

above, occurring in connection with the operation of Campbell and the other employers mentioned, have a close intimate and substantial relation to trade, traffic, and commerce among the several states and tend to lead to labor disputes burdening and obstructing commerce and the free flow of commerce.

"(6) It may be fairly anticipated that, unless restrained, respondent will repeat or continue the picketing set forth in findings of fact 5(d), (e), (f) and (g) above, or similar or like acts and conduct, an object thereof being to force or require Fuller, Southeastern, Flagler, Barge, Hardin, Wesley, Thompson, and other employers of persons, to cease using, selling, handling, transporting or otherwise dealing in the products of Campbell, or to cease doing business with Campbell.

Conclusions of Law

"There is reasonable cause to believe that:

"(1) Campbell is engaged in commerce within the meaning of Section

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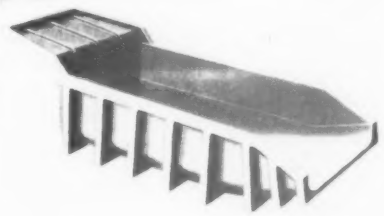

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2, subsections (6) and (7) of the Act.

"(2) Respondent is a labor organization within the meaning of Section 2(5), 8(b) and 10(1) of the Act.

"(3) This court has jurisdiction of the parties and the subject matter of this proceeding and, under Section 10(1) of the Act, has jurisdiction to grant injunctive relief.

(4) By the picketing set forth in findings of fact 5(d), (e), (f) and (g), respondent has engaged in unfair labor practices within the meaning of Section 8(b), subsection (4) (A) of the Act, and affecting commerce within the meaning of Section 2, subsections (6) and (7) of the Act, and that a continuation and these practices will impair the policies of the Act as set forth in Section 1(b) thereof.

"(5) To preserve the issues for the determination of the Board as provided in the Act, it is appropriate, just and proper, that, pending the final adjudication by the Board of the matters involved herein, respondent, its officers, representatives, agents, servants, employes, attorneys, and all members or persons in active concert or participation with them be enjoined and restrained from the commission and continuation of the picketing, and like or related acts of conduct, the commission of which in the future is likely or may be fairly anticipated from respondent's acts and conduct in the past.

Order Temporary Injunction

"This cause came to be heard upon the verified petition of John C. Getreu, regional director of the Tenth Region of the National Labor Relations Board, for and on behalf of said Board, for a temporary injunction pursuant to Section 10(1) of the National Labor Relations Act, as amended, pending the final adjudication of said Board with respect to the matters involved and upon the issuance of an order to show cause why injunctive relief should not be granted as prayed in said petition. The court has considered the pleadings, motions, evidence, briefs, arguments of counsel, and the entire record in this case, and has made and filed its Findings of Fact and Conclusions of Law. Now, therefore, upon the entire record, it is

"Ordered, adjudged and decreed that, pending the final adjudication of the National Labor Relations Board with respect to this matter, Respondent, Sales Drivers, Helpers, and Building Construction Drivers, Local Union No. 859, International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America, AFL, its officers, representatives, agents, servants, employes, attorneys and all members or persons in active concert or participation with it, be, and they are

hereby, enjoined and restrained from:

"(A) Picketing any operation of Fuller, Southeastern, Flagler, Barge, Ira H. Hardin, Wesley, Thompson, or the operations of any other customer of Campbell Coal Co., or

"(B) By means, including requests, appeals, orders, instructions, directions, picketing, or by any like or related acts or conduct, or by permitting any such to remain in existence or effect, engaging in, or inducing or encouraging the employes of Fuller [and the others named], or of any other employer, to engage in, a strike or concerted refusal in the course of their employment to use, manufacture, process, or otherwise handle or work on any goods, articles, materials, or commodities, or to perform services for their respective employers, where an object thereof is to force or require [the contractors named], or any other employer or person, to cease using, selling, handling, transporting or otherwise dealing in the products of Campbell Coal Co., or to cease doing business with Campbell Coal Co.

Clinker Studies

(Continued from page 76)

investigation carried out jointly with Keil,. In this investigation, the chemical composition of the clinker was purposely varied, so that different degrees of lime-saturation and different amounts of liquid phase were used. It was not possible, as a result of this, to show any connection between liter-weights and strength, or between liter-weight and the content of free lime. The measurement of liter-weight may thus not be used for an assessment of the quality of a clinker if the variations in the composition are too great.

In 1938 Dubuisson[5], Luxemburg, communicated the result of a comprehensive investigation of the connection between liter-weight and strength. In the curve is given a representation of the results with over 1000 different samples of clinker. One finds, as will be seen, a very pronounced maximum at 1480 g/1. Dubuisson points out that at the plant in question there is strict supervision of the raw mix for the kilns. If such controls are applied, the determination of the liter-weight constitutes a good check on the burning.

In 1951 Yoshii and Murakami[6], Japan, published the results of investigations carried out at Japanese cement plants. They consider that the degree of burning should be measured with the porosimeter method worked out by them, and by means of which they have found a relation between porosity and strength. In order to relate this method to the methods currently in use, an investigation of the relation between porosity and liter-weight de-

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termined in the usual way has been carried out. This investigation has shown that the connection is linear, and that there is considerable agreement between liter-weight and porosity. The results arrived at by these writers can therefore be transferred to liter-weights, when it will be found that the maximum strength corresponds to a liter-weight of 1200 g/1. By controlling the burning process and the burners, improvements in the operating results have been made.

Finally, in 1954, Zlatanos[7] has published an investigation of the connection between liter-weight and the grindability of clinkers. In this connection, he has classed the clinker produced according to its liter-weight and determined the strength of cement ground from different sorts of clinker. He has found that if a mill is charged with clinker having the same grain-fraction but of different liter-weight, the clinker with the higher liter-weight is more easily ground.

The investigations reviewed above all show that the liter-weight is a good measure of the degree of burning of the clinker in a modern plant where the composition of the raw material has been controlled in a satisfactory way, and that at all events as regards the strength, a definite maximum exists at a certain liter-weight.

Lime Operating Meeting

(Continued from page 103)

slides showing many applications and details of construction.

He first classified refractories on the basis of chemical behavior, mineralogical composition and physical form; and briefly discussed the uses of solid masonry and suspended masonry. Monolithic construction was described as applying to any refractory structure or enclosure which is constructed to required form or shape by using monolithic type refractory materials (castables, plastics and ramming materials). Such enclosures are formed to require shape by casting or ramming as a monolith.

Monolithic constructions are finding greatly increased use in modern refractory practice and have benefited by the many developments in the application of plastics and ramming materials said Mr. Witschey. These materials were first used as maintenance materials but now are employed in many combinations in complete furnace enclosures. Monolithic enclosures may employ castables which are sized and poured like concrete or applied by gun placement.

Materials consist essentially of mortars, castables, coatings, plastics and insulating materials and most of these products are acidic and belong to the fire clay or alumino-silicate classifica-

tion. Plastic refractories are refractory furnished in moldable form and were originally developed to make small repairs. Development of suitable anchors and supports along with development of improved materials permitted the use of plastics for complete structures. They correspond in properties to those of high duty and super duty fire clay refractories. High early strength plastics have been a recent development, to give high strength and greater resistance to abrasion, erosion and mechanical shock.

Castable refractories are mix and pour type products which are placed much like structural concrete. They are essentially mixtures of grog or calcine (aggregate and high alumina hydraulic cement) with the addition of other materials to produce workability and water retention among its desirable properties. The best known is the standard castable, using high-heat, first quality fire clay grog as an aggregate. Maximum service temperatures for this product are usually about 2600-2700 deg. F.

Many special products have evolved, including castables suitable for gun or pneumatic application, for high structural strength, for extreme resistance to abrasion and for insulating use.

In rotary kiln installations, monolithic refractories are or may be used in firing hoods, patented coolers, dust collectors, power plants, ducts, breechings, stacks, chain sections, tail block or nose block assemblies, kiln closures and possibly for quadrant sections according to Mr. Witschey. In vertical kiln plants they are used or are applicable to fire box sections, charging zones, discharge sections or shears, and chutes.

Some of the foregoing applications were described in detail and illustrated. The greater intricacy of modern kiln hoods makes brick masonry difficult and favors the use of monolithic refractories and specifically of the plastic type. Patented coolers as used in the portland cement industry were shown, where some had complete monolithic enclosures. In dust collectors, flat arches, suspended curtain wall baffles, air-cooled walls and openings lend themselves well to monolithic construction. High-early-strength plastic is being increasingly used for kiln liner closures and patches. Castable refractories may be used to patch or replace damaged nose block sections in order to avoid or postpone shutdowns.

Based on installations in grey iron cupolas, it is believed that castable refractories would be adaptable for charging zones of vertical kilns and in limestone hoppers and other abrasion points.

(Continued on page 110)

Unpopular fellow ...the pig in a poke...

You find a lot of sight-unseen horsetrading these days. Especially in the refractory business. You might, for instance, buy a perfectly good refractory product — and see original costs go up and up *and up* . . . through careless planning or construction. But when you call for Plibrico service, you're demanding a *complete* package.

First, Plibrico offers you a real planning and engineering service, including original design and blueprinting. Next, Plibrico's thoroughly experienced men select the refractories best suited — virtually custom-made — for *your* job. Finally, all a part of the same package, *responsible* Plibrico construction crews *finish the job*, quickly and economically. You may feel that you're paying a little more. But when you call for Plibrico service, you *know* you're getting your money's worth!

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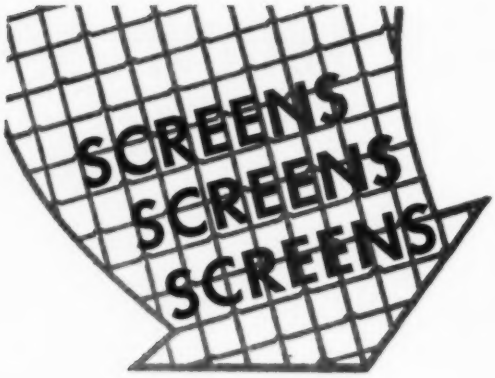

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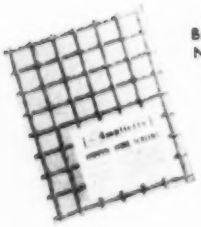
New SIMPLICITY Screen Plant

SIMPLICITY Woven Wire Screens in a wide range of wire gauges and openings are available for shipment from huge stocks in our warehouses within a few hours after receipt of your order. Edges formed and banded to fit any type of vibrator. Newly expanded production facilities permit fast action on special orders.



Bulletin No. 66

FOR COMPLETE DETAILS

Write today for Bulletin No. 66 describing the complete line of SIMPLICITY Woven Wire Screens. You will find SIMPLICITY Screens are expertly woven and do a fast, accurate job of sizing and separating aggregates of all types. Good abrasion resistant qualities insure long life and dependable service with minimum downtime for repairs or replacement. *Phone or wire us for immediate shipment of your rush orders.*

Simplicity

Engineering Company • Durand, Michigan

Sales representatives in all parts of the U.S.A.

FOR CANADA: Canadian Bridge Engineering Co., Ltd., Wolkerville, Ontario

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In a Hayward, there's no contact between the closing mechanism and the material handled. This means much less wear, reduced upkeep, big savings in bucket maintenance. THE HAYWARD COMPANY, 50 Church St., New York 7, N.Y.

HAYWARD BUCKETS

CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES

famous for performance since 1888

ROCK PRODUCTS FEATURES TIMELY INDUSTRY NEWS EACH ISSUE

Gear Practices

W. L. Schmitter, vice president of engineering, The Falk Corp., Milwaukee, Wis., gave an illustrated talk entitled, "Modern Gear Practices in the Lime-Cement Industry," in which he summarized developments in gear manufacture and outlined best practices and trends in the selection and use of gears. This talk was illustrated with a great number of slides showing applications and the manufacture of gears.

Herringbone gears are recommended for power shovels in preference to helical gears because of more simplicity in application. Double reduction housed gears are the practice for belt conveyor drives and packaged standard enclosed motor-reducers are available and applicable for many drives. Much of the development in recent years has emphasized enclosures to keep out dust, and more effective lubrication. If gears are properly selected to suit the job, Mr. Schmitter said that they should have a life of at least 20 years and outlast the driven equipment.

The simplest drive for a mill is the low-speed motor with coupling to the pinion gear engaging the ring gear on the flange of the mill. The helical or single herringbone gear is preferred to the spur gear because of the higher ratio of reduction available. High-speed motors with helical gears are used in this application, but the trend, he said, is to the low-speed motor and gear and coupling which provides a single reduction.

Reason for preference for the single helical gear to spur gears in this and some other applications is that there is a series of gear tooth contacts which make for a more uniform drive. In the case of spur gears, the shape of the teeth must be perfect for contact whereas the helical trace insures continuity of motion. In the case of ball mills, shocks can result in separation of the gear tooth contact which again favors the helical gear with its simultaneous contacting of several teeth. There is also a trend to the use of helical gears for main kiln drives.

Fluid Drives

R. A. Harmon, dealer sales supervisor, Twin Disc Clutch Co., Racine, Wis., in a talk "Hydraulic Couplings — Application, Operation and Maintenance," explained the operating principle of fluid drives and discussed their use in specific lime plant applications. He covered use of the fluid coupling and the torque converter.

The fluid coupling may be used to drive equipment in either direction whereas the torque converter is limited to driving in one direction. Over-

loads may stall a fluid coupling but will not stall the motor, he said, and therefore a motor need not be burned out due to overloads.

Many other advantages were mentioned. The ability to absorb shocks in the case of crushers and mills, through slippage, is one. Higher starting torque is available, often making it possible to use a smaller motor, because as the motor accelerates it approaches 75 percent of synchronous speed before the coupling works.

Normal slip is 3-4 percent which represents a speed and horsepower loss but not a loss in torque. Fluid couplings are of advantage when balancing loads between pairs of motors. The torque converter is an infinitely variable transmission.

Among applications listed for either one or the other drive is in power shovels (couplings) where the shock may thus be dampened and cable life increased. Torque converters may also be used in this application. When used on trucks, fluid couplings save on brakes, clutches and transmissions. Their use on small trucks as well as large ones is considered justified.

When used on crusher drives, the fluid coupling slips while the load is accelerating and absorbs shock. If there be overloads, the coupling stalls. Its use on screens is considered advantageous in cold weather starting and, on bucket elevators, it minimizes snapping of the belts. Other uses suggested are for screw conveyors, kilns, mills, fans, generators and marine engines.

Asbestos Development

QUEBEC ASBESTOS CORP., East Broughton, Que., Canada, reportedly plans to spend a minimum of $7,000,000 for the development of newly discovered asbestos deposits near Broughton, in the eastern townships. The project includes construction of a refining plant capable of handling 2000 tons per day; a 2-mile railroad siding; and an electric power transmission line. The company is already exploiting an important asbestos development in East Broughton.

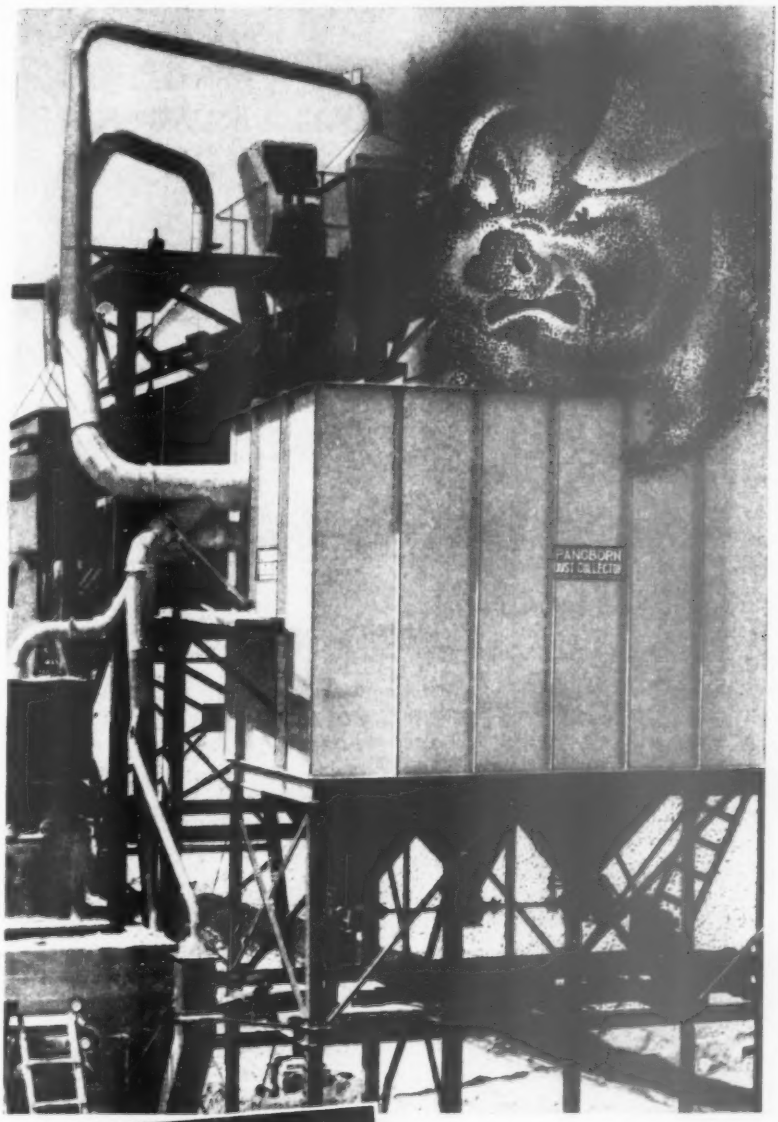
Sand Dredging Plant

TAYLOR BROTHERS, GLASGOW, MO., has applied to the Corps of Engineers for a permit to dredge sand and gravel from the Missouri River. The proposed dredging site is a 12-mi. stretch beginning 3 mi. south of Pony Express Bridge and extending north.

Changes Firm Name

THE CORPORATE NAME of The Kelly Island Lime and Transport Co., Cleveland, Ohio, has been changed to Kelley Island Co., as recently announced by the company.

PANGBORN **STOPS** THE DUST HOG



Pangborn DUST CONTROL improves product quality

for the H. E. Fletcher Co., West Chelmsford, Mass.—by making possible the marketing of cleaner granite products. In addition, Pangborn Dust Collectors guard employees' health from dangerous dust, protect costly machinery, and permit the salvage of valuable material for resale.

50th Anniversary Medallion

What can Pangborn do for you?

Pangborn engineers will be glad to discuss *your* dust control needs—show you how Pangborn equipment can save you time, trouble, and money. For more information, send for Bulletin 909-A today! Write to: PANGBORN CORPORATION, 4300 Pangborn Blvd., Hagerstown, Maryland.

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DIGGING • HAULING

AUTOMATIC DUMPING

You can cut handling costs by using a

SAUERMAN SCRAPER

Here's How — Sauerman Scrapers move sand and gravel, ore, crushed stone, coal and other bulk material rapidly . . . . Normal operating speeds using a Sauerman Hoist are 250 fpm. on the inhaul with loaded bucket and 500 fpm. on the outhaul with empty bucket.

Its versatile working range enables you to work a small area or reach out 1,000 feet or more. Sauerman Scrapers travel across a river or wide stockpile, up to the top of a hill or down into a deep pit.

First cost is moderate and, since the scraper literally floats on the material after loading, wear is held to a minimum. The bottomless scraper bucket provides rugged durability with light weight. The result is economy in power consumption—gasoline, electric or diesel.

Add to these advantages, the labor costs of just one man—situated in a safe location overlooking the work site—controlling the entire job operation . . . and you obtain an efficient, economical installation. Sauerman Scrapers range in size from 1/3 to 15 cubic yards. Write for Catalog A: Power Drag Scrapers or Catalog E: Bulk Storage By Power Scraper.

SAUERMAN BROS., Inc.

530 S. Clinton St., Chicago 7, Ill.

ONE MAN MATERIALS HANDLING

SAUERMAN BROS., INC.

Dust Control

(Continued from page 79)

er type kettles and collectors. In 1937 this plant underwent expansion but so great are the demands on this unit that another program is now going on. When this project is finished, calcining will be done in the new kettles as a continuous process, not in batches, as previously. There will be four of these kettles served by the electrical precipitators.

Both types of dust collectors thus have their place in National Gypsum operations. On the calcining kettles, the electrical precipitators gather a finer dust than can be done with a cyclone collector, making them more efficient and economical for this purpose. On the pre-kettle grinding operations, however, by the Raymond mills, where the dust is coarser, the cyclones are considered an excellent type of dust collector and allow reclamation of most of the dust.

Suffice it to say that both types are economically sound and have resulted in a minimum of dust nuisance both in the plant and in the air that surrounds the mine and plant areas.

Compressed Air Piping

(Continued from page 86)

der to avoid air valves being left open unnecessarily by the plant operator, some form of alarm signal can sometimes be introduced; for example, based on excessive pressure drop and and installation of a pressure gauge with minimum contact.

Air leakage due to defective valves or fittings can be avoided by applying "preventive maintenance" to the whole compressed air plant. This means that a time schedule is prepared, following which each part of the plant is regularly inspected and tested according to a predetermined plan. Part of this schedule will be detection of faulty or leaky valves and fittings. Air leakage from pipe joints can be easily detected

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The new WILFLEY MODEL K Centrifugal Sand Pump embodies important mechanical improvements especially adapted to the handling of cement slurry and results in stepped-up production and substantial power savings. Individual engineering. Write for details.

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A. R. WILFLEY & SONS, Inc.

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WILFLEY centrifugal PUMPS

by applying a soap solution to suspected points.

The causes can be manifold, such as bad packing material, vibration, water-hammer, sagging pipe hangers or bad roller supports, etc. A survey of leakage of pipework is best made during standstill periods of tools served by the air system. The hissing noise of escaping air from leaky points is then a sure guide, in addition to the soap bubble method. By fitting a very accurate and responsive pressure indicator to the main header, the pressure drop during standstill periods of the plant gives a useful indication about air leakage.

Week-ends and holiday periods are most suitable for chasing leaks in pipework and machinery, and for their immediate repair after detection. Insertion of antivibration pieces, made from seamless metallic flexible bellows tubing, often cures development of air leaks.

STATEMENT REQUIRED BY THE ACT OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946 (Title 39, United States Code, Section 233) SHOWING THE OWNERSHIP, MANAGEMENT, AND CIRCULATION OF

ROCK PRODUCTS, published monthly at Chicago, Ill., for October 1, 1954.

1. The names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher—Maclean-Hunter Publishing Corp., 309 W. Jackson Blvd., Chicago 6, Ill.

Editor—Bror Nordberg, 309 W. Jackson Blvd., Chicago 6, Ill.

Managing Editor—Ralph S. Torgerson.

Business Manager—P. D. Allen, 309 W. Jackson Blvd., Chicago 6, Ill.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given.)

Maclean-Hunter Publishing Corp., 309 W. Jackson Blvd., Chicago 6, Ill. The stockholders of the Maclean-Hunter Publishing Corp. are P. D. Allen, 255 Locust Rd., Winnetka, Ill.; R. K. Davis, 6920 S. Green St., Chicago 21, Ill.; F. S. Chalmers, 86 Chestnut Park, Toronto, Ont., Canada; Horace T. Hunter, 120 Inglewood Drive, Toronto, Ont., Canada; Maclean-Hunter Publishing Co., Ltd., 481 University Ave., Toronto, Ont., Canada.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)

None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which the stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required from daily, weekly, semiweekly, and triweekly newspapers only.) . . .

P. D. Allen
Business Manager

Sworn to and subscribed before me this 30th day of September, 1954

[SEAL]

Clara M. Brockschmidt

(My commission expires March 13, 1956.)

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give • SHARP SEPARATION
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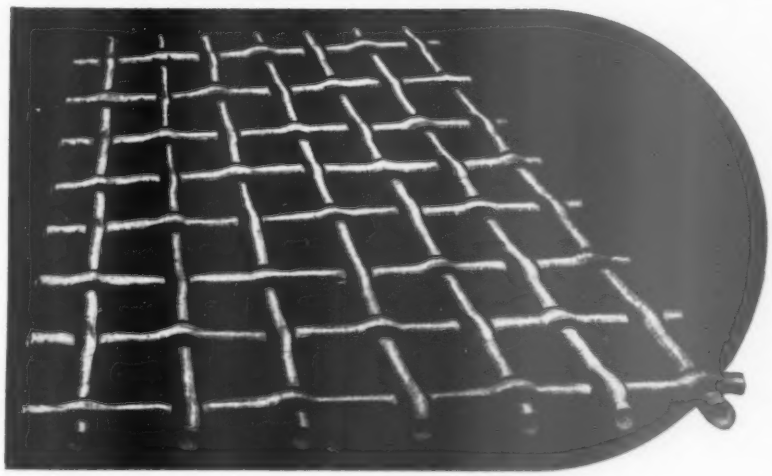

1 **SHARP SEPARATION**—CAL-WIC Industrial Screens are precision crimped and woven extra tightly on specially designed, super-powered hydraulic looms. All openings keep their accurate spacing throughout the life of the screen.

2 **HIGH PRODUCTION**—You make maximum use of your equipment when you use CAL-WIC Industrial Screens. Down-time is reduced to a minimum because these screens are ruggedly constructed from hard, tough steel. Uniform spacing reduces blinding as well as rejections due to oversized particles.

3 **LOW COST**—The special analysis steel used exclusively in CAL-WIC Industrial Screens assures high resistance to abrasion, vibration and fatigue. And the tightly woven construction prevents "hidden wear" caused by abrasives working in between top and bottom wires at their intersections.

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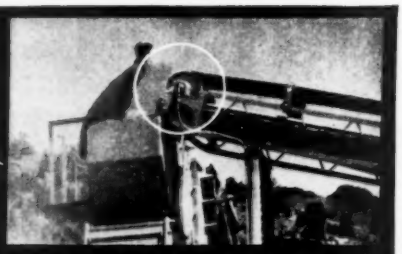

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- No chains out in the weather and grit, so there's no chain failure, or chain idlers to keep adjusted and oiled.
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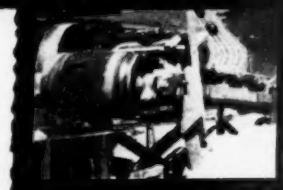

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The reduction gears and electric motor . . . *the only moving parts* . . . are inside the pulley drum, fully enclosed and protected by the pulley shell. Wherever there are belt conveyors or belt-bucket elevator installations, Motorized Head Pulleys are the answer to your maintenance man's prayer.

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Honor N.S. & G.A. Officers at Los Angeles Dinner

ON THE EVENING of September 20, 1954, the Southern California Rock Products Association and the Southern California Ready Mixed Concrete Association were hosts at an Industry Dinner in the Music Room of the Biltmore Hotel, Los Angeles to industry members from New Mexico, Nevada, Arizona, and from the California counties of Kern, Riverside, San Bernardino, Ventura, Orange and San Diego. The dinner was given in honor of John W. Murphy, president of the Union Sand and Gravel Co., of Spokane, Wash., who is the president of the National Sand and Gravel Association, and of Vincent P. Ahearn, executive secretary, National Sand and Gravel Association and the National Ready Mixed Concrete Association. Over 200 attended the dinner.

Harold E. Bender, president of the Southern California Rock Products Association introduced Robert Mitchell, president of the Consolidated Rock Products Co. and vice-president of the Southern California Rock Products Association, who acted as master of ceremonies. Mr. Mitchell introduced the out-of-town guests of the industry, the members of the two local associations, and Noel J. Redmond who is the president of the Blue Diamond Corporation and also the president of the Southern California Ready Mixed Concrete Association.

In introducing President John W. Murphy of N.S. & G.A., Mr. Mitchell spoke of the great work that he was doing for the sand and gravel industry throughout the United States, and the amount of effort and personal time he was devoting to these activities. Mr. Murphy addressed the gathering and gave a clear outline of the various phases of association work which was going on through the work of the staff and officers of the National Sand and Gravel Association. He told of the new problems which are facing the industry in the matter of zoning, the diminishing supplies of available raw material and the necessity for competent engineering research in the setting up of natural resources areas so that the people of this nation might continue to be able to secure aggregates for the future construction of homes and public improvements.

Mr. Ahearn, upon being introduced by Mr. Mitchell, talked to his audience most interestingly on the great industry problems of percentage depletion and labor. He described the Washington picture at the present time, and gave his opinions of the possibilities of important coming events in the nation's capital.

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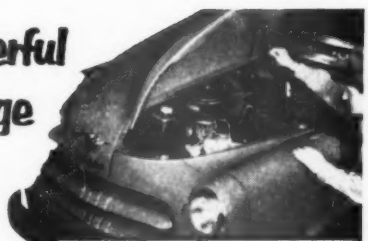

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New Power-Dome V-8 delivers sensational 145 hp. . . . more than any other low-tonnage truck engine

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Max. HP. of leading ½-, ¾-, 1-ton trucks	145-hp.	130-HP.	126-HP.	125-HP.	112-HP.
HP. per cu. in. displacement	.601	.544	.524	.503	.476

Best truck visibility!

Facts prove it

MAKE	DODGE	TRUCK F	TRUCK I	TRUCK G	TRUCK C
Windshield Area	951 sq. in.	938 SQ. IN.	841 SQ. IN.	728 SQ. IN.	728 SQ. IN.
Total Vision Area	2261 sq. in.	2103 SQ. IN.	1705 SQ. IN.	1890 SQ. IN.	1890 SQ. IN.

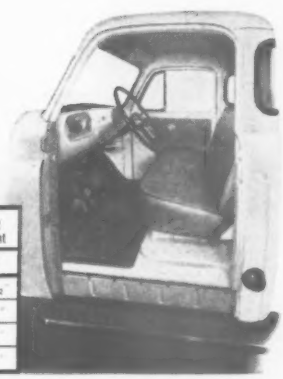
Sharpest turning trucks!

and here's the proof...

Make of ½-ton Pick-Up	No. of ft. for U-Turn
DODGE	36¾'
TRUCK F	37½'
TRUCK I	38½'
TRUCK G	41'
TRUCK C	39½'

Roomiest truck cab!

Here's proof!



Make of Truck	Hip-room	Shoulder-room	Seat Height
DODGE	61¾"	58⅜"	16"
TRUCK F	60¾"	56¼"	15 11/32"
TRUCK C	60"	55½"	14¼"
TRUCK G	60"	55½"	14¼"
TRUCK I	58¼"	57"	13⅞"

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ASK US TODAY ABOUT A BETTER DEAL FOR THE MAN AT THE WHEEL!

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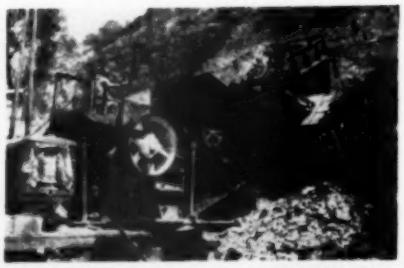
GRUENDLER STATIONARY JAW CRUSHER For semi-permanent aggregate plants.



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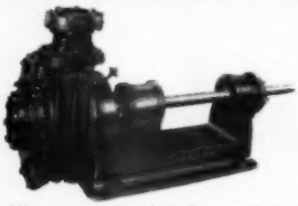

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You'll get more service, more production with Krogh Pumps because they are 100% lined with hard chilled alloy cast iron for maximum abrasion resistance, or alloy steel for impact strength when handling rock. Liners—available from stock—are easily installed. External wear-take-up adjustment extends operating hours. Design of Krogh Pumps makes them especially suited for handling high concentrations and maximum size particles with suction lift against high head and low rotative speed.

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MANUFACTURERS NEWS

A. P. GREEN FIRE BRICK CO., Mexico, Mo., announces the election of H. B. Plunkett as executive vice-president. He has been with the firm for over 35 years, and has served as sales correspondent, territory salesman, general superintendent of works, general sales manager, secretary, vice-president and director, also vice-president and manager of domestic and Canadian affiliate companies. Mr. Plunkett has for many years held important positions in the refractories industry. He has headed various national committees and has been active in trade associations since the early 1920's. He is presently serving as chairman of the Mellon Institute Committee which controls the research program of The Refractories Institute.

H. B. Plunkett

CONCRETE TRANSPORT MIXER CO., St. Louis, Mo., has announced the appointment of William H. Carroll as regional sales manager to direct sales and sales promotion for the inclined drum and open-top truck mixers in Texas, Oklahoma, Louisiana and Arkansas, with headquarters in Dallas, Texas. A graduate of Texas College of Mines, El Paso, Mr. Carroll has had considerable experience in the equipment and construction fields, including sales work with R. G. LeTourneau, Inc., Caterpillar Tractor Co., Bucyrus-Erie Co. and Merritt-Chapman & Scott.

William H. Carroll

GARDNER-DENVER CO., Quincy, Ill., announces that Charles M. George has been appointed assistant to G. V. Leece, president. He was formerly sales administrator. J. W. Gardner, who was recently elected a member of the board of directors, has been named administrative assistant. B. P. Spann, director of personnel, has been elected vice-president, and George W. Gutekunst, formerly district manager in Los Angeles, has been appointed general sales manager in Quincy, Ill.

UNITED STATES RUBBER CO., New York, N. Y., has announced the appointment of Walter F. Brown, formerly north-central division manager, as assistant sales manager for the U. S. tires division. He will be succeeded as

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Merit Your Confidence

REO—one of the world's leading engine builders—has now applied to industrial power the same foresight and experience which developed the world's most modern truck engine.

On all 50-180 continuous horsepower services—operating on gasoline, liquefied petroleum gas, or natural gas—these dependable spark-ignition REOs deliver (1) high horsepower to displacement and weight; (2) low-cost operating efficiency, (3) long service life, (4) easy maintenance, (5) simplified major repairs.

Get all the money-saving facts about the many REO heavy-duty features and low operating costs. Write for specifications and name of nearest dealer.

INDUSTRIAL AND MARINE ENGINE DIVISION
REO MOTORS, INC., LANSING 20, MICH

Why this conveyor is easy on belts

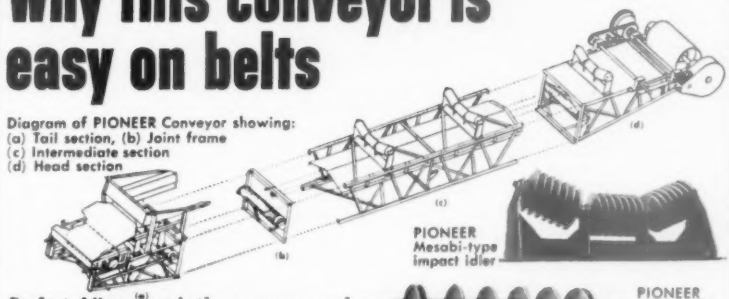


Diagram of PIONEER Conveyor showing:
(a) Tail section, (b) Joint frame
(c) Intermediate section
(d) Head section

PIONEER Mesabi-type impact idler

PIONEER Rubber roll self-cleaning return idler

PIONEER Self-aligning troughing idler

Perfect Alignment is the answer...and far less belt replacement is the result.

First, PIONEER Continuflo Conveyors are jig-built at the factory, with joint frames between the sections to keep them straight and true.

Second, Head and tail pulleys are of large diameter to prevent belt slippage.

Third, Flexible rubber impact idlers absorb shock of falling materials, thus reducing cutting and wear of belt.

Fourth, Specially-designed self-aligning troughing idlers, in addition to forward tilt of regular idlers, hold belt in line.

Fifth, New-type self-cleaning rubber return idlers virtually eliminate build-up of abrasive materials on roller.

Sixth, Rollers and idlers turn easily. Anti-friction bearings are used throughout. This also cuts power requirement.

Needs fewer support towers

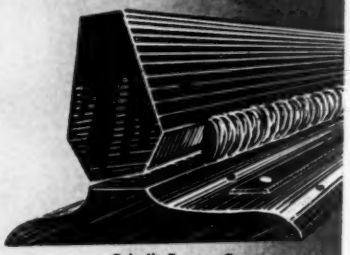
Another outstanding feature of PIONEER Conveyors is their extra strength and rigidity. Angle iron construction, welded vertical and diagonal braces, and upper and lower chords tied together with lattice-frame construction make it possible to space support points as far apart as 40 feet.

It's easy to assemble PIONEER conveyors because no section is over 10' in length. Head and tail sections are specially built to meet your H.P. requirements. For details, write Pioneer Engineering Works, Inc., Minneapolis 13, Minn. (subsidiary of Poor & Company, Chicago).

Pioneer Continuflo EQUIPMENT

IT'S AMAZING... how much longer Tractor Shoes last when you--

REPAIR WORN
TRACTOR GROUSERS
with
MANGANAL
U.S. Patents 1,876,738—1,947,167—2,021,945



Rebuilt Tractor Grouser

11%-13½% Manganese-Nickel Steel
SPECIAL SHAPE
APPLICATOR BARS

Mill Depot Stocks: Newark • Wilkes Barre (Forty-Fort) Indianapolis • Chicago

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NEAREST DISTRIBUTOR UPON REQUEST
SOLE PRODUCERS 92 N. J. RAILROAD AVE. NEWARK, N. J.

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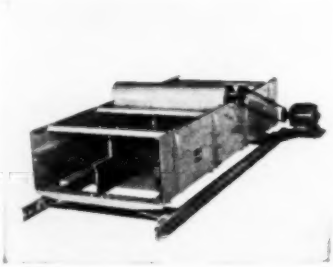
GIVES THE UNIVERSAL ITS SUPERIORITY IN HANDLING TOUGH SCREENING JOBS!

From feed to discharge end, every inch of the screening surface of a UNIVERSAL Screen has exactly the same intensity of vibration. That's important when you're running seasonably damp material!



IN 35 YEARS OF SERVICE TO INDUSTRY UNIVERSAL SCREENS ARE WELL-KNOWN FOR GIVING REAL SATISFACTION AND ECONOMY TO PLANT OPERATORS EVERYWHERE. PRICES OF LATEST MODELS MAKE UP-TO-DATE, QUALITY SCREENING AVAILABLE TO ALL!

Write today for latest catalog No. 150 on "Screens and Screening"

UNIVERSAL VIBRATING SCREEN CO.
RACINE — — WISCONSIN

north-central division manager by J. A. Napier, formerly district manager at Pittsburgh. J. S. Baker, assistant district manager, succeeds Mr. Napier, and W. L. Anderson, formerly division promotion manager in Chicago, becomes the district manager at Omaha, succeeding D. A. Buchanan, who has a special assignment in the truck tire department.

CLARK EQUIPMENT CO., Battle Creek, Mich., has announced the appointment of L. A. DePolis as general sales manager of the industrial truck division. He was formerly sales manager for Ross Carrier Co. When the company was acquired by Clark last year, he became assistant to the vice-president in charge of industrial truck sales. In his new position, Mr. DePolis will supervise sales efforts of Clark dealers in the United States and Canada.

L. A. DePolis

GOODYEAR TIRE & RUBBER CO., Akron, Ohio, announces that Dr. R. P. Dinsmore, vice-president in charge of research and development, was recently awarded a 40-year service pin by P. W. Litchfield, chairman of the board. An international authority on natural and synthetic rubber, Dr. Dinsmore was also honored at a testimonial dinner attended by more than 300 persons, including many key figures in the rubber industry. Principal speaker was Dr. Webster N. Jones, vice-president in charge of industrial and government relations for Carnegie Institute of Technology, Pittsburgh, Penn.

AMERICAN BRAKE SHOE CO., New York, N. Y., has appointed Edward F. Needham as district sales manager of the Denver area for the Ramapo Ajax division, with headquarters in Denver. W. C. Muller continues as western sales manager for the division but will make his headquarters in San Francisco, Calif.

INTERNATIONAL PAPER CO., New York, N. Y., has announced opening of a new sales office in Des Moines, Iowa, for the Bagpak division, covering Iowa, South Dakota and Missouri. Dale Rowe heads the new office.

COLUMBIA MACHINE CO., Vancouver, Wash., announces that North Carolina has been added to the sales territory of L. B. King, sales representative in South Carolina.

PANGBORN CORP., Hagerstown, Md., manufacturer of blast cleaning and dust control equipment, celebrated its 50th anniversary recently with an open house at the Pangborn plant. Tours

IT'S VULCAN
FROM THE BEGINNING

TO THE END

Shown above is a 12′x22′ combustion chamber, for use with a 12′x175′ two tire Vulcan rotary kiln. When fully assembled it will be used for the production of titanium oxide. This is just one of the many times that The Vulcan Iron Works has been called upon to design and build a complete unit. A complete unit that has been designed, and is being built to give maximum performance with a minimum of maintenance.

When you build or re-build, contact Vulcan of Wilkes-Barre. The manufacturing facilities are of the latest, and their engineering department is fully staffed to design all types of complete installations. Why don't you let Vulcan, their engineering staff, and their 105 years of experience work for you. Estimates, constructive suggestions, and preliminary drawings will be furnished (as far as possible) without obligation. Write for Bulletin A-442 on Rotary Kilns, Coolers, Dryers, Retorts and other dependable processing equipment today.

Any information on items listed below will be sent to you immediately:

- Rotary Kilns, Coolers and Dryers
- Rotary Retorts, Calciners, Etc.
- Improved Vertical Lime Kilns
- Automatic Quick-Lime Hydrators
- Briquetting Equipment
- Open-Hearth Steel Castings
- Heavy Duty Electric Hoists
- Self-Contained Electric Hoists
- Cast-Steel Sheaves and Gears
- Diesel Locomotives
- Electric Locomotives and Larrys
- Steel Plate Fabrications
- Hydraulic Presses

VULCAN IRON WORKS

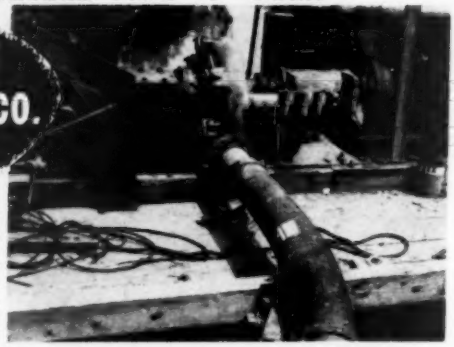
NEW YORK OFFICE
50 CHURCH ST., N.Y., N.Y.

WILKES-BARRE, PA., U.S.A.
ESTABLISHED 1849

CABLE ADDRESS
"VULWORKS WILKESBARRE"

360 YDS. DREDGED DAILY—DAY AFTER DAY WITH THIS NAGLE TYPE "T" PUMP

at F. J. DOMKE SAND & GRAVEL CO.
LA CROSSE, WISC.



THIS compact Mississippi River dredge is a hustler. The Nagle 6" Type "T" Pump is paying its way—readily slurping up 45 yds. per hour plus. All parts in contact with dredged materials are of tough, wear resistant manganese steel. Impeller is readily accessible. Simple packing gland adjustment. Built to eliminate trouble.

Nagle Pumps "pay off" on aggregate dredging, sand washing, drainage and recovery of sand or tailings for reprocessing. Horizontal and vertical shaft pumps in a wide range of sizes for all the abusive applications involved in every sand and gravel plant.

Get the facts—Send for Catalog 5206.

NAGLE PUMPS

NAGLE PUMPS, INC.
1299 CENTER AVENUE, CHICAGO HEIGHTS, ILLINOIS

PUMPS FOR ABRASIVE AND CORROSIVE APPLICATIONS

through all departments, unveiling of tribute to Thomas W. Pangborn and his brother, John C. Pangborn, founders, were included in the celebration, also a special program of entertainment.

IOWA MANUFACTURING CO., Cedar Rapids, Iowa was erroneously reported in a prominent financial newspaper as having been acquired by Square D Manufacturing Co., Detroit, Mich. The company acquired by Square D Co. was the Iowa National Manufacturing Co.

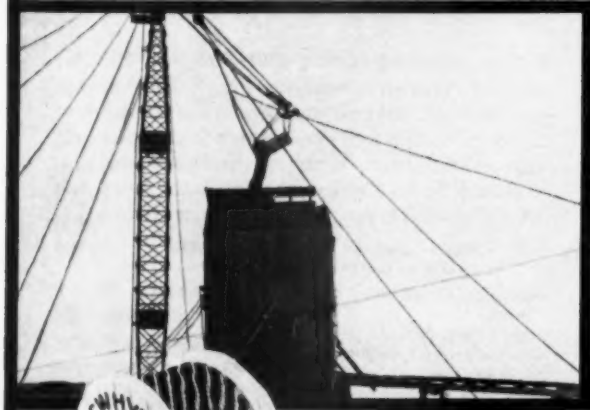
JOY MFG. CO., Pittsburgh, Penn., announces the appointment of Walter J. Pilarski as manager of the contract core drilling division, and Frank M. Capp as manager of sales engineering, core drilling division. Both are successors to J. B. Martin who passed away recently.

THE GALION ALLSTEEL BODY CO., Galion, Ohio, has appointed Truck Equipment Co., Atlanta, Ga., as distributors in Georgia.

LUDLOW-SAYLOR WIRE CLOTH CO., St. Louis, Mo., announces removal of its Chicago office to 5807 W. Diversey Ave.

BLAW-KNOX CO., Pittsburgh, Penn., announces the transfer of Carl F. Weiblen from Pittsburgh to Chicago as sales engineer for clamshell buckets.

Ask for Monarch Whyte Strand for all your quarry equipment



You'll get maximum service from the ropes on your equipment if you use the correct rope. There is a Monarch Whyte Strand PREformed and internally lubricated wire rope designed with the flexibility and abrasion resistance needed to meet the rigorous requirements of quarry equipment of all types.

There are a thousand and one types and sizes of wire rope made by Macwhyte. Our engineers will be glad to help you get maximum service. Ask for recommendations. Call a Macwhyte distributor or write to:

MACWHYTE WIRE ROPE

MACWHYTE COMPANY 2949 Fourteenth Avenue, Kenosha, Wisconsin
Mill Depots: New York • Pittsburgh • Chicago • St. Paul • Fort Worth • Portland Seattle • San Francisco • Los Angeles • Distributors throughout U.S.A.

Send for Macwhyte Catalog #G-16.

1082-R

SYMONS VIBRATING ROD GRIZZLIES for heavy duty big capacity scalping from ½" up to about 4".

SYMONS VIBRATING BAR GRIZZLIES for heavy duty large capacity primary scalping from 1½" upwards.

SYMONS VIBRATING ROD DECK SCREENS for low cost, big capacity screening of wet and sticky material.

SYMONS® SCREENS

...from the *HEAVIEST SCALPING*

...to the *FINEST SCREENING*

SYMONS HORIZONTAL SCREENS for level, positive screening with greater capacity of more accurately sized products . . . ideal for asphalt plants—with drive *outside* dust and heat.

● *SYMONS VIBRATING SCREENS* have been serving the mining industry for almost twenty years. The wide range of types and sizes enables you to select the *right* screen for your particular application. These quality screens have gained an enviable reputation for dependability, efficiency and economy . . . backed by the same high standards of accuracy, design and workmanship, and the same advanced engineering that is used in the manufacture of *all* Nordberg Machinery.

Mail the coupon for further details.

SYMONS "V" SCREENS for big capacity single cut wet or dry separations—even in much finer meshes than possible with conventional screens.

SYMONS...A Registered Nordberg Trademark Known Throughout the World

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NORDBERG

MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

NEW YORK • SAN FRANCISCO • DULUTH • WASHINGTON
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MAIL THIS COUPON TODAY

NORDBERG MFG. CO., Milwaukee, Wisconsin RP

Please send me further information on the following screens for coal preparation service:

☐ Symons Horizontal Screens ☐ Symons "V" Screens
☐ Symons Rod Deck Screens ☐ Symons Grizzlies

Name_____ Title_____

Company_____

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City_____ Zone_____ State_____

S254

Always insist on genuine
BLAW-KNOX REPAIR PARTS

- **cut clamshell maintenance costs**
- **reduce costly downtime**
- **prolong bucket life**

BLAW-KNOX repair parts are especially designed to fit your Blaw-Knox Clamshell. They contain *all* the carefully engineered features of the original parts to assure the efficient operation, low maintenance and long life you expect from Blaw-Knox products.

There's no need to use a costly "mongrel" bucket . . . always insist on genuine, factory-built repair parts.

Write for a parts book today, if you don't have one, giving the serial number of your bucket.

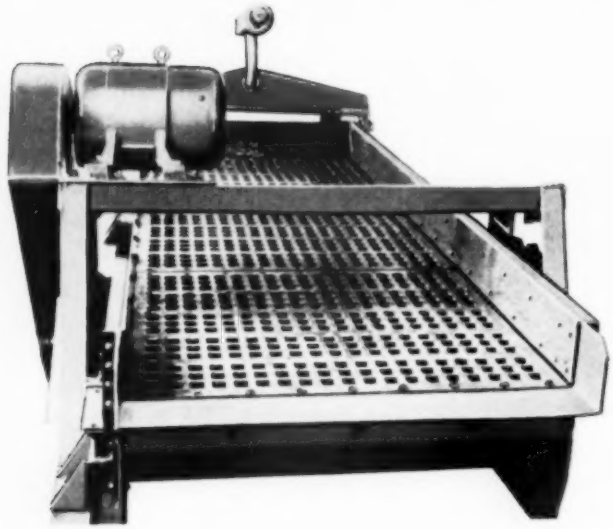
BLAW-KNOX COMPANY
BLAW-KNOX EQUIPMENT DIVISION
DEPARTMENT 351
PITTSBURGH 38, PA.
Offices in Principal Cities

Get this "Bucket Saver" booklet

It's the *only* booklet available with a bucket-saver list of "do's" and dont's on clamshell use and abuse. It illustrates reeving methods that improve bucket performance. It gives complete details on bucket repair. It contains 40 pages of usable information. Write for Bulletin 2373 today!

PHONE . . . WIRE . . . WRITE . . . YOUR **BLAW-KNOX** *DISTRIBUTOR*

Takes rough treatment in its stride



Hendrick Perforated Metal Plate takes the knocks and bruises of constant heavy-duty screening without altering uniformity of material. Because the holes can not stretch, Hendrick Perforated Plate assures large quantity screening without expensive, time-wasting blinding. And decks can be changed quick-as-a-wink! Supplied either flat or corrugated, Hendrick Perforated Metal is available in any desired shape and size of openings in high carbon, stainless steels and in other commercially rolled metals.

Write for further details—or phone Hendrick direct.

SEE OUR CATALOG IN SWEET'S

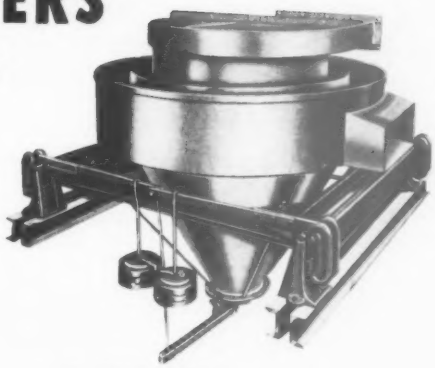
Hendrick
MANUFACTURING COMPANY
47 DUNDAFF STREET, CARBONDALE, PA.
Sales Offices in Principal Cities

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids

For the SHARPEST SPLIT in size of products that any Classifier can offer, use...

AUTO VORTEX CLASSIFIERS

. . . which are delivering the most exacting classifications in large and small tonnages in plants throughout the country.



If you want the sharpest splits . . .
If you want the bulge in the middle removed . . .
If you want recovery of wasted fines . . .

AUTO-VORTEX CONES alone . . .
or CONES and BOWLS in combination . . .
or BOWLS alone . . .

. . . can make your most exacting specifications! Write for our brochure, and we'll refer you to plants that are doing it!

The CONE Classifier Manufactured exclusively by the CHARLES E. WOOD CO.

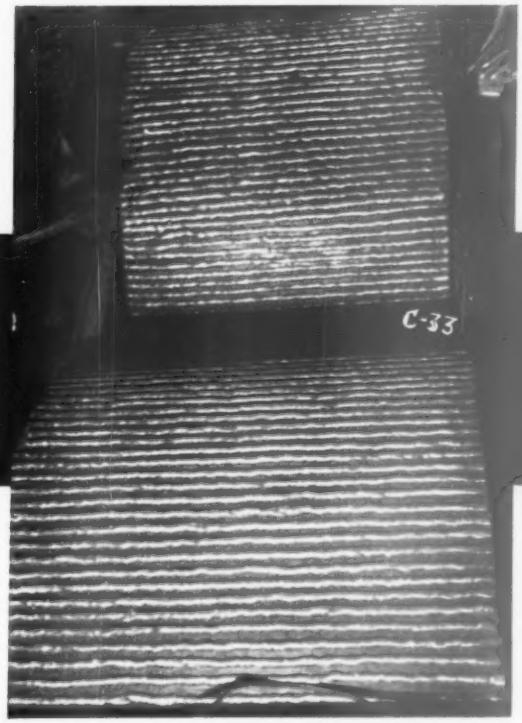
PATENTED; PATS. PEND.

CHARLES E. WOOD COMPANY

906 NORTH WATER ST. • MILWAUKEE 2, WISCONSIN

"Resisto-Loy" hard-facing beads spaced ¾ inch apart on new smooth manganese crusher rolls not only increase production, but if properly maintained with "Resisto-Loy" eliminate the necessity of rebuilding the rolls.

hard-surface your New Crusher Rolls with "RESISTO-LOY"



Note in photo that by placing beads ¾ inch apart new beads can be placed between the older beads each time. Thus rolls retain their shape at all times. This is a job your own welder can efficiently handle. For information on maintaining and rebuilding all types of crusher machinery, call in our field man. He is a specialist.

RESISTO-LOY COMPANY, INC. Grand Rapids 7, Michigan

to low-cost bucket elevator service

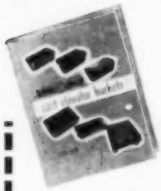
HERE'S why Link-Belt Cast Buckets will pay off in longer life, better handling. These rugged buckets have uniform sections and smooth surfaces, thanks to special casting techniques. Their corners, lips, ends, and backs are reinforced for maximum rigidity.

Get all the facts on Link-Belt's broad line of cast buckets for both belt and chain. Book 2465 gives full ordering information. All styles are available in malleable iron or Promal and can be made of aluminum or bronze. See your nearest Link-Belt office or distributor.

LINK-BELT

CAST ELEVATOR BUCKETS

13,583



CLIP THIS COUPON AND MAIL TODAY

LINK-BELT COMPANY
220 S. Belmont Ave., Indianapolis 6, Ind.
(Or Your Nearest Link-Belt Office)

Please send me immediately a copy of Book 2465, "Link-Belt Cast Elevator Buckets."

Name_____
Position_____
Firm_____
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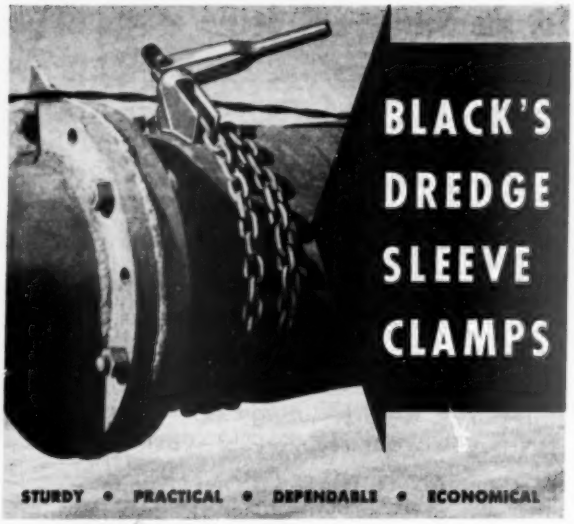
City_____ Zn__ State_____



Furnishes a positive seal for round flexible joints. Used by leading dredging and hydraulic sand-and-gravel operators, and the U. S. Engineering Corps. This Multi-use chain sleeve clamp is easy to apply . . . positive in action. Write for illustrated folder, today.

THE BLACK BROTHERS CO., INC., 505 9th Ave., Mendota, Illinois

LOW COST CRUSHING POWER

for fast "secondary breakage"

use FREDERICK CAST semi-steel BALLS with E-Z Swing Steel Eye

Tough and rugged, Frederick Wrecking Balls deliver crushing power where you need it. They're made to stand abuse—to give you long, economical service. Inverted steel eye gives cable protection plus free-swinging action. Special release hooks for free dropping also available. Shipments made promptly from stock of these sizes: 500 lbs., 1000 lbs., 1500 lbs., 2000 lbs., 3300 lbs., 4000 lbs., 5200 lbs., 6500 lbs., 8000 lbs.

Write today for prices and free literature on our new line of Balls and Cable Weights . . . or phone for prompt delivery.

FREDERICK IRON & STEEL, INC.

FREDERICK *Since 1890* MARYLAND

CENTRIFUGAL PUMPS • MUNICIPAL & GRAY IRON CASTINGS

CONCRETE PRODUCTS

A SECTION OF ROCK PRODUCTS

CONCRETE UNITS · READY-MIXED CONCRETE

Ready-mixed concrete and block plants of Allied Supply Corp., Charlottesville, Va.

Concrete Supplier and Contractor Agree:

"Duraplastic* provides a more workable mix... better results...at lower cost"

CONCRETE SUPPLIER Herbert Kneller, v.p. and general manager of the Ezra Stipp Construction Co., Scranton, Pa., reports: "Our customers show a preference for ready-mixed concrete made with Duraplastic cement. That's why we've used it since it was first introduced. Experience has shown that Duraplastic produces excellent results for almost every type of construction work."

WELL-KNOWN BUILDER D. W. Richardson, president of the R. D. Richardson Construction Co., Scranton, Pa., also recommends Duraplastic. "Duraplastic gives us a more workable, plastic mix," says Mr. Richardson. "This means we get better placing and appearance at lower cost to us."

POURING TRANSIT-MIXED DURAPLASTIC concrete for Bell Telephone Dial Exchange in Olyphant, Pa. General Contractor: R. D. Richardson Constr. Co.; Ready-Mixed Concrete: Ezra Stipp Constr. Co., Scranton, Pa.

WORKABLE CONCRETE made with Duraplastic facilitates placement work in construction of this type. Workmen find it easy to place Duraplastic concrete properly around steel reinforcing.

Many others throughout the building and construction field have learned to count on the advantages of Duraplastic air-entraining portland cement. Duraplastic makes a more plastic, more cohesive, more uniform mix—less mixing water is needed for a given slump . . . segregation and water gain are minimized.

What's more, with Duraplastic you can save on construction time. That's because the greater plasticity of Duraplastic-made concrete is a real aid to faster, easier placement. All these advantages – *plus* improved surface appearance – are yours when you build with Duraplastic.

YET DURAPLASTIC COSTS NO MORE! It sells at the same price as regular cement and requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For descriptive booklet, write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

OFFICES: *Albany, Birmingham, Boston, Chicago, Dayton, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.*

*"*Duraplastic" *is the registered trade-mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.*

CP-D-163

ATLAS® **DURAPLASTIC**

AIR-ENTRAINING PORTLAND CEMENT

Makes Better Concrete at No Extra Cost

UNITED STATES STEEL HOUR—Televised alternate weeks—See your newspaper for time and station

INDUSTRY NEWS

Big Lightweight Concrete Job

TEXAS INDUSTRIES, INC., Dallas, Texas, has contracted to supply 16,500 cu. yd. of Haydite lightweight concrete and 130,000 Texcrete Haydite masonry units for the new $15,000,000, 21-story, 1001-room Hotel Statler, currently under construction at Dallas and scheduled for completion in the fall of 1955. The savings in dead weight, over conventional concrete, reportedly will total approximately 29,000,000 lb. The hotel is said to be the first multi-story, flat-slab cantilever supported lightweight concrete building in the Southwest. The cantilever principle eliminates about half the space-consuming columns necessary in older-type buildings. The Haydite aggregate for the building is being supplied by Dallas Lightweight Aggregate Co., while the masonry units are being supplied by Texcrete Co. of Dallas, both subsidiaries of Texas Industries, Inc.

Big Pressure Pipe Contract

UNITED CONCRETE PIPE CORP., Baldwin Park, Calif., has been awarded a $3,896,146 contract for construction of the Davis Aqueduct for the United States Bureau of Reclamation's Weber Basin project in north central Utah, between Ogden and Salt Lake City. Approximately 18 miles of reinforced concrete pressure pipe, ranging in diameters from 48 to 84 in. are being supplied by the corporation's Pleasant Grove, Utah, plant.

Cover Picture

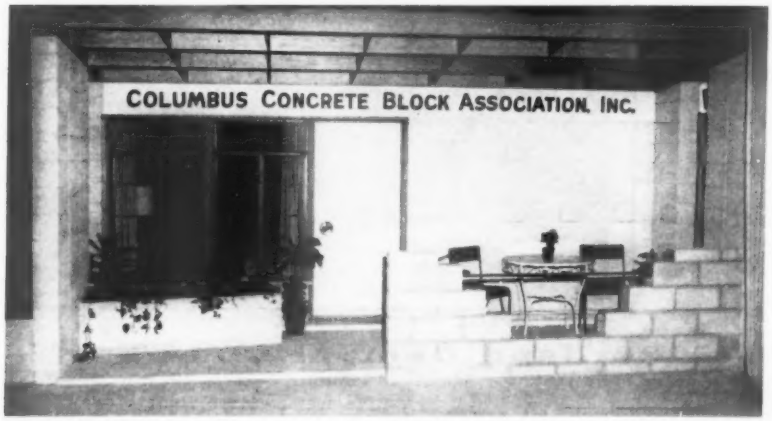
ON THIS MONTH'S COVER is an illustration of the Allied Supply Corporation plant buildings near Charlottesville, Va. In the foreground is the ready-mixed concrete plant and immediately back of it is the concrete block plant. An interesting storage silo design, developed by the president of the company, is used. This company is one of the co-owners of Virginia Lightweight Aggregate Corporation, Roanoke, Va., producer of Weblite lightweight manufactured aggregate made from a clay-shale mix.

Products Company Reorganized

WESTERN CONCRETE PRODUCTS CO., Bismarck, N. D., has been incorporated, and W. C. Brown, who started the company last year, has sold his entire interest in the firm. K. C. Bellows, formerly of Sheridan, Wyo., is president and general manager of the new corporation; Mike Dolan, owner of the Monarch Concrete Co., Minot, N. D., is vice-president; Peter E. Albrecht, Mandan, N. D., is secretary-treasurer; and Ralph Brown, Bismarck, N. D., continues as office manager and assistant plant manager. Plant production reportedly is to be increased. The company specializes in lightweight Molite block.

N.C.M.A. Receives Awards

THE NATIONAL CONCRETE MASONRY ASSOCIATION was awarded a Certificate of Exceptional Merit for its booklet, "Ideas for Wall Patterns With Concrete Masonry," in a competition for outstanding architectural literature, sponsored jointly by the American Institute of Architects and The Producers' Council, Inc. The association also received Honorable Mention for its booklet, "Design and Construction of Lintels For Concrete Masonry Buildings."



Concrete block patio, shown above, was the featured display of the Columbus Concrete Block Association at the annual Builders Exchange Home Show at Cleveland, Ohio. Stacked joints, tooled horizontal and flush vertical joints, half block extruded an inch in the long wall for decorative effect, 2- x 8- x 16-in. patio block, were displayed

JR & T, a ready-mixed concrete company at Herrin, Ill., has expanded plant operations by the addition of a second transit-mixer truck, new scales and hopper, and a conveyor belt for discharging concrete into the truck mixer. Plant capacity is 60 cu. yd. of concrete per day. Owner of the company is Joe Garegnani, who established the plant in August, 1953.

SCHAEFER BROTHERS BUILDERS SUPPLY CO., Inc., producer of concrete and cinder block, has been purchased by Arrow Materials Corp., dealer in lumber and other building supplies. Cost of the transaction was reported at $300,000. The Schaefer firm name and employes will be retained. President of the company is Nicholas J. Meleo, with Ralph Monrad as executive vice-president.

SCHULTZ CONCRETE PRODUCTS, Minot, N. D., formerly owned by Kenneth A. Schultz, has been sold to Clarence D. Johnson, who will continue to operate the plant under the same name. The company produces concrete block, septic tanks, cesspools, chimney block, well curbing and other concrete products.

PITTSBURGH COKE AND CHEMICAL CORP., Youngstown, Ohio, is building a concrete pipe plant adjacent to its idle Struthers blast furnace. The plant will be operated by the Neville Concrete Products Division.

THE OHIO VALLEY SAND CO. of New Martinsville is building a ready-mixed concrete plant at Sisterville, W. Va.

ARROW MATERIALS CORP. has purchased Schaefer Bros. Builders Supply Co., Inc., of Rochester, N. Y. The firm continues to produce concrete block under the same name. Nicholas J. Melco is president of the firm.

MOELLENDORF'S READY MIX CO., has been established at Fredericksburg, Texas, by James and J. C. Moellendorf, who also operate a sand and gravel plant at Fredericksburg.

RUSS VANDE BRAKE has begun operations at his ready-mixed concrete plant in Orange City, Iowa.

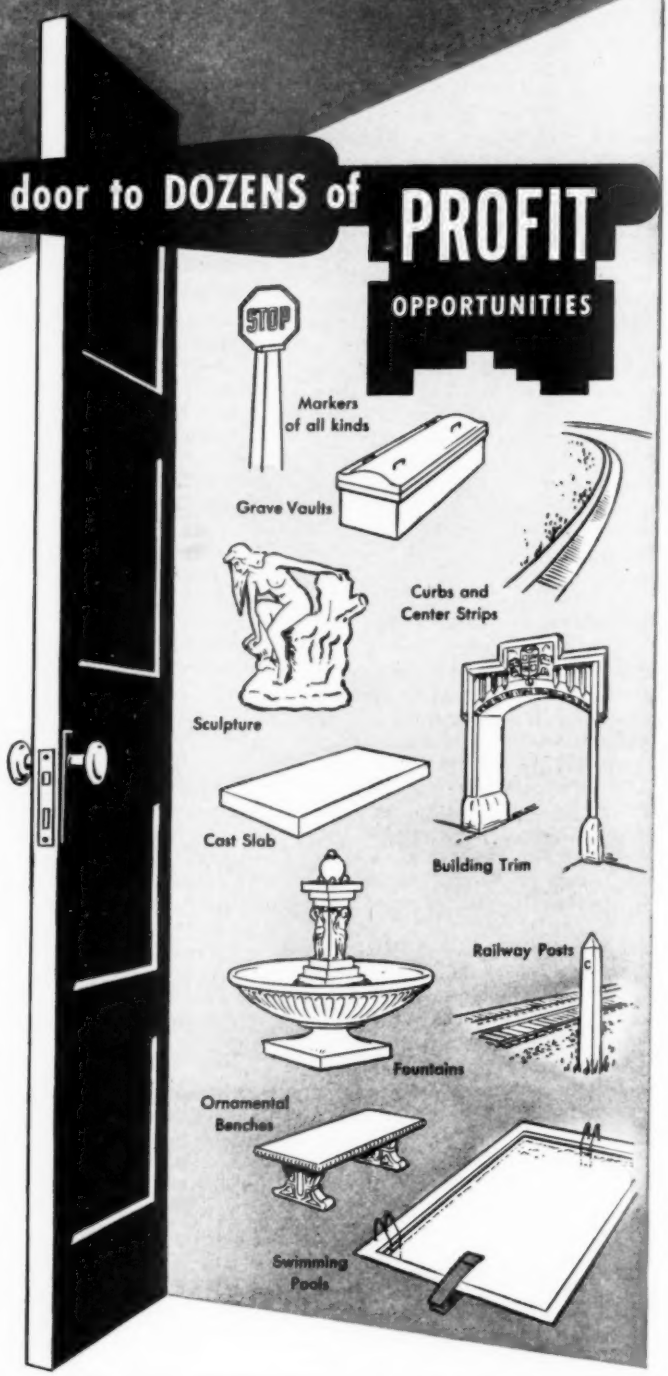
READY MIXED CONCRETE CO., Lawrence, Kans., has announced a $15,000 expansion program to double the present capacity.

THE SHAW CONCRETE CO., Champaign-Urbana, Ill., is being managed by Howard, Earl and Albert Shaw, sons of the former owner, Phillip E. Shaw, who died recently.

T & T READY MIX CO. was recently established at Tama, Iowa, by George R. Smith, Cedar Rapids, Iowa. Louis F. Smith is general manager.

MEDUSA WHITE Portland Cements...

open the door to DOZENS of PROFIT OPPORTUNITIES



● Medusa White, the original White Portland Cement plain or waterproofed, white or tinted, actually opens the doors to an almost unlimited range of profit possibilities in the concrete products field. Those uses shown to the right are but a few. Wherever greater distinctive character and beautiful color effects are desired, whether it be in cast stone, concrete, cast slabs or any product that is made of concrete it can be made better and more beautiful with Medusa White Portland Cement, or Medusa Waterproofed White Portland Cement.

Now you can begin to see the tremendous sales possibilities for the concrete products manufacturer who utilizes Medusa Diamond-Blue, White (the original white) Portland Cement or its companion Medusa Waterproofed White Portland Cement for making his products. There is no end to the ideas that you can give your customers through the application of these cements to their building requirements. These cements are made by a company producing the finest in regular and special cements for over 60 years. You can rely on their integrity.

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WHITE TILE GROUT CEMENT

MAKERS OF AMERICA'S FINEST PORTLAND CEMENTS FOR OVER SIXTY YEARS

Jaeger truck mixers set profitable pace

2 payloads of stiff concrete per hour (3 miles round trip, in traffic)

The Patterson Riverside Bridge at Dayton, Ohio, built by Maxon Construction Co., required 10,000 cu. yds. of State Specification concrete of 3" maximum slump (6,000 yds. for the bridge and the balance for the approaches).

By averaging 2 payload trips per hour, 3 miles round trip, in traffic, 5 to 7 Jaeger 4½-yard "Mix Plus" truck mixers were able to deliver 300 cu. yds. in less than 6 hours in a maximum day's pour. This rate of production was made possible by good plant operation, plus the ability of Jaeger mixers to charge, mix and discharge low slump specification concrete faster than any other make of truck mixer.

On this job, the "dual mix" drums, equipped with Jaeger's sealed end loader, enabled Dayton Builders Concrete Co. to charge without blowback in less than 15 secs. per yd., to mix thoroughly in transit, and to discharge equally fast. One quick turn of a hand wheel opens the Jaeger hopper for an uninterrupted flow of mix.

"Mix Plus" truck mixers are available in capacities of 3 to 7½ yds. (4¼ to 10¼ yds. as agitators). The widest range of optional choices of equipment enables you to meet your local condition, payload requirement, weight limitation and wet-mix or dry-batch operation with standard units readily mountable on standard makes of trucks.

Ask your Jaeger distributor to show you the many plus features of the Jaeger "Mix Plus". Or send for Specification TMB-4.

THE JAEGER MACHINE COMPANY

603 Dublin Avenue, Columbus 16, Ohio

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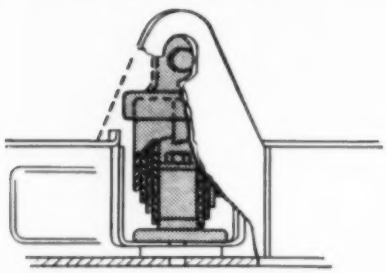
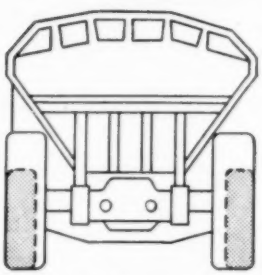


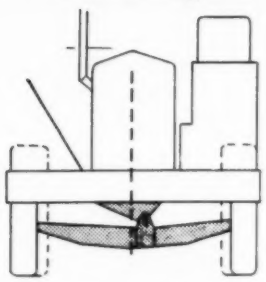
Smooth ride

Heavy, snubber-type spring is mounted between Dumptor main frame and the steering axle. Shock-absorbing action gives plenty of "cushion", takes jolts out of rough, off-road travel. Easy on operator and machine.



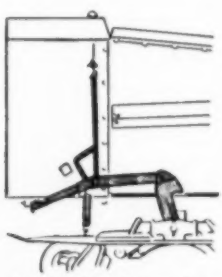
Tires track in direct line

Wider, heavier steering axle puts Dumptor steering wheels in direct line with big drive wheels. Tires track in the same path. There's less rolling resistance — better traction in soft ground and over rough haul roads.



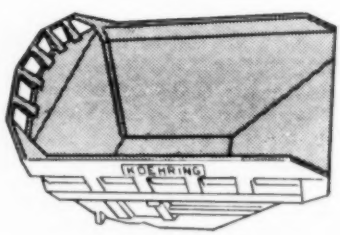
Off-set pivot on axle

Pivot point on steering axle is offset from center line 3¼" toward operator side of machine. There's no sag, even with unbalanced load. Steering axle oscillates 21°, keeps twisting strains out of main frame.



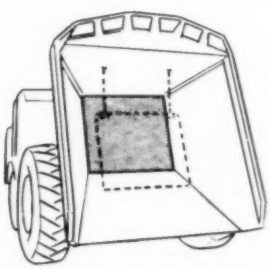
New body-latch, dump lever

Body latch for 1-second gravity dumping is simple, trouble-free. Latch is engaged by a single hook, mounted on the chassis frame. Dump lever is located inside the cab, in an easy-reach position at the operator's left.



Streamlined, all-steel body

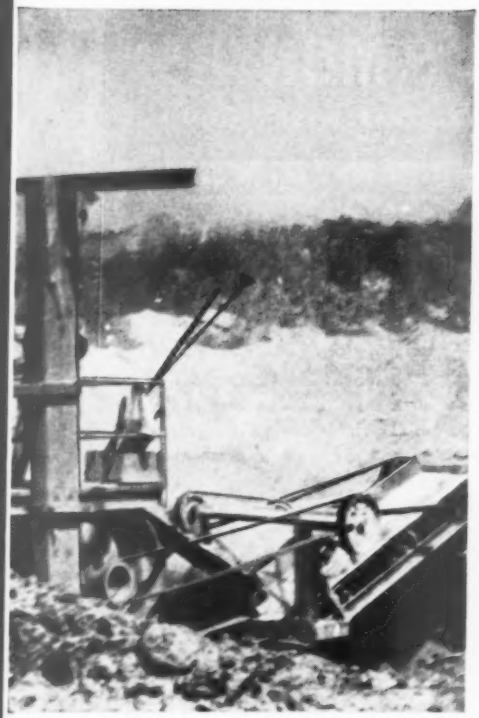
Inside is free of bulges or ledges. Top edge is box-beam constructed. Sides, ends are ribbed with 5 and 8" channels. Double-plate bottom is lined with multiple steel beams. Note ridge bar added to rock-guard teeth.



Bolted or free-swinging pan

Heavy steel kick-out pan is ½" thick. Pan can be bolted to body floor for extra protection when loading rock. Remove bolts, and pan has free swinging kick-out action, breaks suction when dumping sticky loads.

CK439



advantages

Take another look at the latest-model Koehring 6-yard Dumptor shown here. It has some important features worth checking . . .

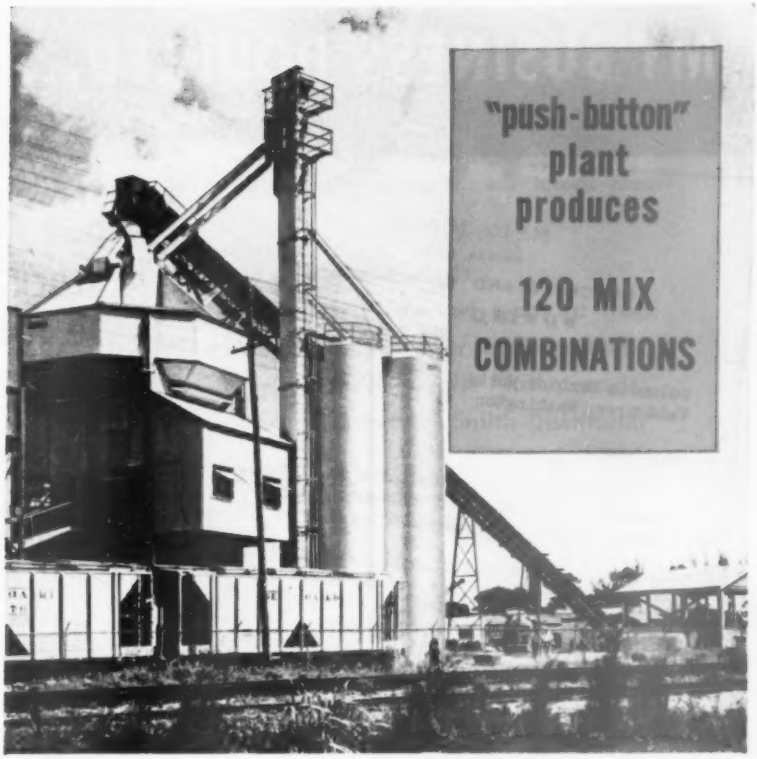
Notice how heavy snubber-spring on steering axle cushions road shocks, yet retains Dumptor's unique advantage of no spring maintenance. There are no leaf springs. Big shock absorbing drive tires eliminate need for springs on drive axle. Alignment of drive wheels with steering wheels adds to efficiency of no-turn shuttle hauling — another basic Dumptor advantage.

Instant gravity-dumping is controlled by simple body latch and new dump lever arrangement. Notice, too, the new streamlined all-steel body. Even with all this heavy-duty strength, Dumptor still has more than 6 h.p. for every ton of loaded weight — accelerates fast, climbs 24% grades fully loaded. See your Koehring distributor for more facts.

KOEHRING COMPANY

Milwaukee 16, Wisconsin

Subsidiaries:
JOHNSON · PARSONS
KWIK-MIX



"Repeater" automatically re-batches any mix selection

At the turn of a dial and push of a button, this Johnson commercial transit-mix plant produces any one of 120 different size and type batches of aggregates and cement. It weighs out any combination of materials you select on the central dial-scale control panel . . . and automatically repeats any batch selections for a pre-determined number of times.

The electric-control, 120-mix-selector panel provides for concrete of various strengths in any combination of materials, in ½ to 2 cubic yard batches. For each size batch there are individual selections for 3 to 6-inch slumps. Dial system makes it easy to change from one mix selection to another. To get any size or type of batch, operator merely turns the selector dial, sets the "repeater", pushes the "start" button . . . and the plant weighs out fast, with pinpoint accuracy. During the batching cycle, a lock prevents accidental change of the mix selector.

Nine material weigh-dials on the control panel have individual pen-recorders. Exact weight of each batch is automatically graph-recorded. Johnson batching equipment consists of: six 5000-lb. aggregate batchers (two with automatic moisture-compensators) . . . a 3000-lb. cement batcher with dual fill valves for selecting 2 types of cement . . . a 2000-lb. water weigh-batcher, and a 5-lb. (80-oz.) air entraining admix batcher. All are fully automatic.

Whenever you plan a new plant . . . or want to modernize an existing set-up, look into the increased efficiency you can get with Johnson equipment. You'll find your Johnson distributor is at your service . . . ready to help at any time.

29

C. S. JOHNSON CO. CHAMPAIGN, ILLINOIS
Koehring Subsidiary

"MY BUSINESS DOUBLED...IN 6 MONTHS"

SAYS MR. H. L. JONES... OF BOLIVAR, WEST VIRGINIA

H. L. JONES
BOLIVAR, W. VA.
CONCRETE AND CINDER BLOCKS
BURIAL VAULTS

January 27, 1954

Columbia Machine Works
Vancouver, Washington

Gentlemen:

I installed a new Columbia No. 8 fully automatic, with magnetic offbearer, pallet return, and cleaner and oiler on July 1, 1953.

Since then my business has doubled. Everyone using our blocks has been well pleased. I am more than pleased with the strength and type of block produced by this equipment.

Our daily average is between 500 and 600 8 by 8 by 16 block per hour.

I highly recommend this machine to anyone in the market for new and fast production.

Yours sincerely,

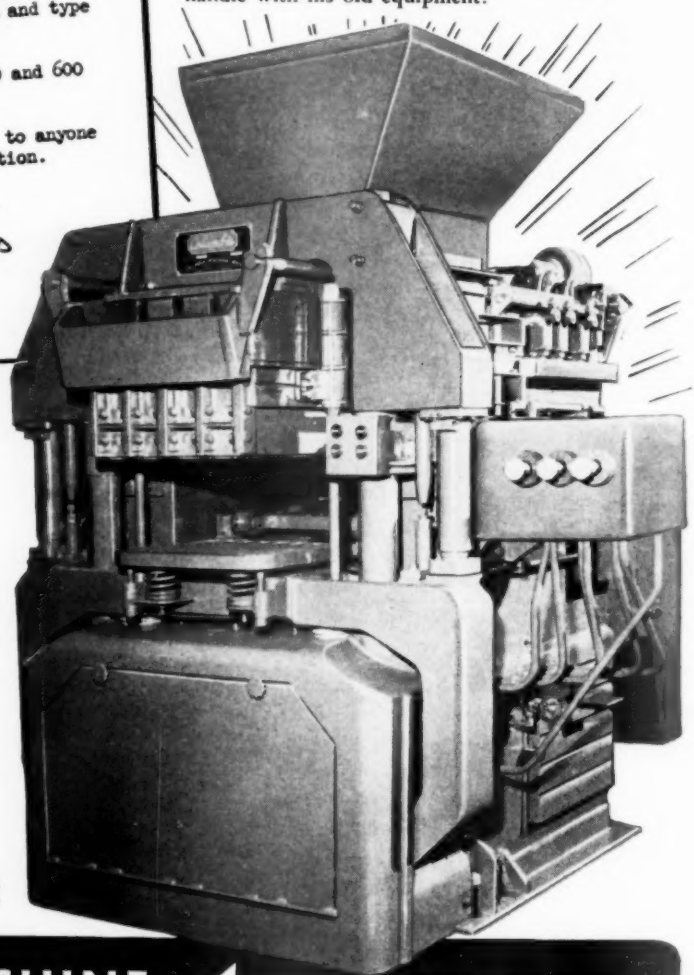
H. L. Jones

H. L. JONES, *Owner*

LLOYD JONES, Jr.

"OUR *Columbia* MODEL 8 BLOCK MACHINE TURNS OUT UP TO 600 BLOCKS AN HOUR..."

Like hundreds of other concrete block manufacturers, who have installed Columbia Model 8 two-block machines, H. L. Jones of Bolivar, W.Va. has discovered that he can get consistently high production of consistently high quality block. Installation of a single Model 8 fully automatic machine has enabled him to gain *twice* the volume of business that he could handle with his old equipment!



A *Real* PROFIT-MAKER

The Columbia Model 8 is the ideal machine for the block producer who wants fast, automatic production of high quality block. Look at these features:

- **4-6 Cycles Per Minute**
- **Fully Automatic Electronic Controls**
- **Vibration Under Pressure**
- **Standard Plain Pallets**

District Offices in: Wisconsin, Ohio, South Carolina, Mississippi, Florida, New Jersey, Massachusetts, Virginia and California.

Columbia MACHINE

Home Office: 107 S. GRAND, VANCOUVER, WASHINGTON
Factory Branch and Warehouse at Mukwanago, Wisconsin

Write today for catalog describing Columbia line of one, two and three-block machines!

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Pace Setters for the Industry!

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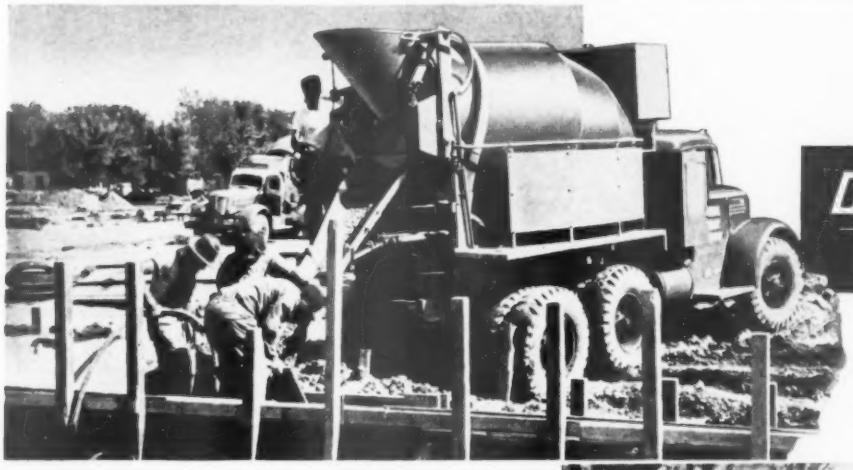

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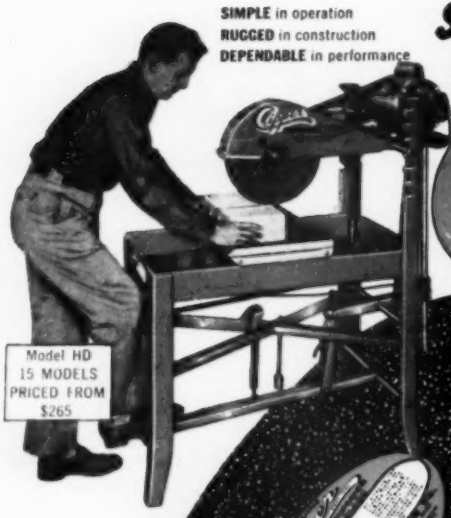

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15 MODELS
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"CBR"

Favorite blade of thousands of masonry saw and hand power saw owners. A Clipper "CBR" Break-Resistant Abrasive Blade is virtually unbreakable . . . bend it — twist it — drop it! For difficult grinding cuts impossible to make with standard abrasive blades.

DIAMOND

Amazing cutting speed and performance are yours with a genuine Clipper Diamond Blade. Rigid quality control, manufacturing "know-how", and the ability to select and use the best materials make Clipper Diamond Blades the World's Finest . . . Use one on your next job!

Clipper Blades Fit Every Make and Model Masonry, Concrete, or Hand Power Saw.

Genuine Clipper Blades are available in sizes and with arbor shapes to fit any make masonry, concrete, or hand power saw. Buy Clipper Blades by the case for Greater Savings!

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The World's Finest Masonry Saw. Simple in operation — Rugged in construction — Dependable in performance. Clipper's patented-exclusive features give you unmatched cutting action. "Select-A-Notches" give instant, positive height adjustments . . . "Pressure Equalizer" automatically adjusts blade pressure. Clipper's FREE TRIAL guarantees you satisfaction at no obligation.

Clipper CONCRETE SAW

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MODEL C-250
25 H.P.
ONE OF 7 MODELS
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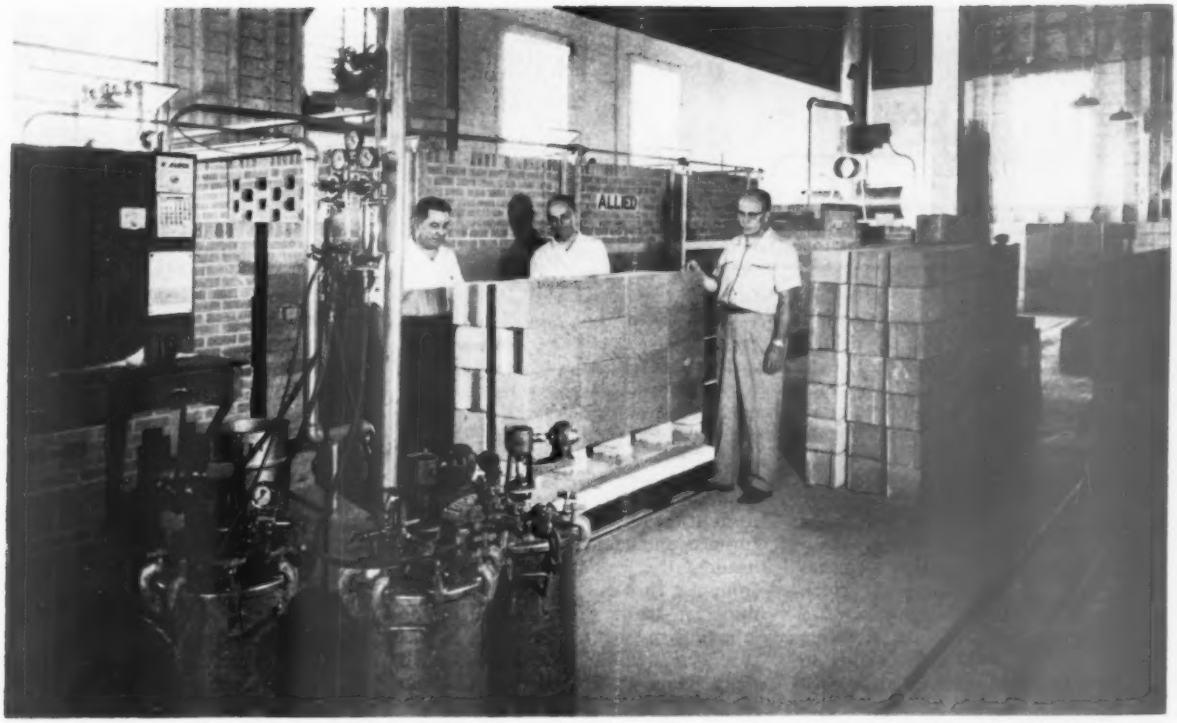


Plant where Glasface block are processed. Operations consist of first applying the undercoat base, the firing of the undercoating, the application of the glaze coat, and the final firing

Apply Ceramic Glazed Face to Block

• United Cement Products Co., Wichita, Kan., sets up equipment in new plant for mass production of Glasface concrete units by a newly developed process

By TIP BROWN

A PLANT HAS BEEN SET UP by United Cement Products Co., Wichita, Kan., for the purpose of applying a true ceramic glazed face to concrete units. This plant is the first of its kind in the world, and adds new horizons to the manufacture of concrete block and opens new fields of distribution. The company's push-button control mixing operations were described in ROCK PRODUCTS, July, 1954, p. 113.

Installation of the new plant was made by the Allied Engineering Division of the Ferro Corporation, Cleveland, Ohio. This company is one of the foremost smelters of enamel and glaze frit, or material that is first smelted into glass, then ground to about 95 percent passing through a 200 mesh sieve, and sprayed or dipped upon material to be glazed or enameled. Their principal business is the preparation of frit for enameling on steel or cast iron and glazing clayware. They also operate in the field of colors for enamels and glazes.

The company, which has been conducting tests for the past 15 years on glazing concrete block surfaces, was approached by Max Miller, president of United Cement Products Co., who has long cherished a desire to add this feature to his manufacturing operation in Wichita. Mr. Miller discussed the matter with Dr. J. T. Robson and H. C. Tucker of the Allied Engineering Division in Cleveland and, to his gratification, learned that Allied was ready to go ahead on the process and were fully satisfied with the results of their long research work. The company sent K. E., "Ike," Evans, one of their engineers, to Wichita to handle the installation of the new plant.

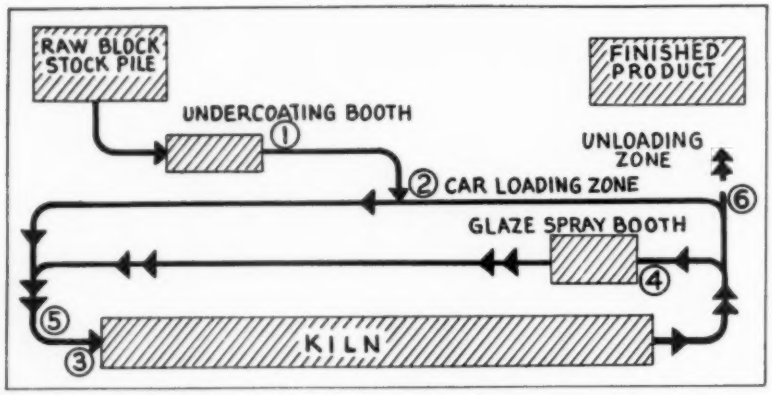
An excellent location for the new operation was established in a 3000 sq. ft. portion of floor space in a building adjoining the concrete products plant. The building formerly housed an artificial ice plant and was acquired some time ago for expansion purposes. It has been used for storage of various building specialties. The ceramic plant occupies only a third of the floor area which allows additional space, if needed, for four times the present productive capacity of the new installation.

Glazing Operation

The overall operation of the new plant consists of first applying the undercoat base; the firing of the undercoating; the application of the glass coat; and the final firing.

The undercoating which is applied first acts as a buffer between the final glaze and the regular portland cement and lightweight aggregate of the base. This undercoating process controls the texture of the finished block which may be made smooth or rough as desired. Block may be of any modular shape or size, and no extra precautions are required in manufacture other than to secure smooth edges and sharp corners.

The block move continuously



Showing flow of block through glazing process; (1) block are undercoated; (2) block loaded on cars; (3) first passage through kiln; (4) glaze is sprayed on; (5) second passage through kiln; (6) unloaded as finished Glasface block

through the undercoating stage by means of an inclined roller conveyor which feeds the block to a rough-surface conveyor belt which furnishes a gripping action to carry the block through the undercoating area at a controlled rate of travel. A vibrating screen applies a dry undercoating to the block face which is then levelled to surface by a squeegee. The block then pass into a chamber where they are hand-sprayed with wet undercoat.

From the far end of the roller conveyor, the block are loaded directly to a kiln car on the adjoining track. The tracks are of 11-in. gauge using 20-lb. rail. The cars have a fabricated steel bed which supports a layer of insulating refractory concrete made of lightweight aggregate and Universal Atlas high alumina "Lumite" cement. Five setter rails of fire brick are laid in two courses on 16 in. centers to provide a chamber for heat circulation beneath the load of 32 undercoated 8- x 8- x 16-in. units which exactly fit the kiln space. They are set four high and four long on the car.

A patented Freeway transfer car handles the loaded cars from the return track to the kiln track for entrance of the undercoated block to the kiln. A setting frame which gauges the size of the setting is first encountered by the block on the way to the kiln. No oversize loads can pass through the setting frame.

The loaded cars roll on to a pusher device which moves them through the kiln by a dolly operated by a drive screw through a split nut clutch similar to that used on metal lathes. The screw shaft is driven by electric motor through reduction gears and chain drive. Speed changes are effected by changing the size of the drive sprocket. Variables between 20 and 70 min. in 10-min. increments for the 65-in. car length are obtainable.

The kiln, itself, is an adaptation of the standard car tunnel kiln used widely in the ceramic industry. The basic form of the kiln consists of preheating, furnace, and cooling zones. In the preheating, the products of combustion from the furnace zone are pulled by draft fan to the charging end of the kiln thus preheating the ware; in this case, concrete block. A controlled temperature gradient is maintained in the furnace zone, reaching a maximum temperature of approximately 1200 deg. In the cooling zone, air at room temperature is blown into the discharge end of the tunnel gradually cooling the block and recuperating the sensible heat. A counter flow of air passes over the block throughout their travel through the kiln.

An unusual precaution to protect the wheels of the loaded cars is provided by the use of air chambers admitting cool air beneath the kiln directly to the wheels; the upper portion of the car being sealed off to prevent loss of heat by means of insulating and fire brick and by a sand seal formed by plates on each side of the car running through a trough which is automatically fed with a sand mixture.

The length of the kiln is 55 ft. The construction is of fire and insulating brick with a sprung arch in the furnace zone held by buckstays and tie rods. Flat refractory tile covers the preheating and cooling zones. Natural gas is piped to the kiln through a 2½-in. line and fed through a zero pressure governor to two low pressure aspirators. Air for combustion is supplied by a centrifugal blower and the mixture is burned in radiant type burners. Temperatures are automatically controlled by potentiometer connected to thermo-couples in the high temperature zone.

After the undercoating fire, cars are transferred without unloading by Freeway transfer car to the track serving the glaze-spray booth. The application of the final coat is made at this point by spraying. The loaded cars are then forwarded on the same track and transferred to the kiln for final firing. The plant is designed to operate on a 12-hr. cycle of undercoating and a 12-hr. cycle of final firing.

The ready-prepared undercoat and glaze materials are shipped dry from the factory, and are mixed with water by means of a portable mixer as required. The desired color is also shipped dry and the required amount added at time of mixing. The specific gravity of the "slip" or slurry is controlled in the plant laboratory.

Product In Variety of Colors

The plant produces four to six standard glazes for regular stock; including brown mottled in light and dark shades, green in the same color shades, yellow and brown mottled, also a green and black combination that is out of the ordinary. A wider range of colors can be supplied on special orders. Because of the high value of the product, a cardboard cap is used over the glazed surface both in storage and in shipment. Blocks are cubed and palletized to permit better and faster handling.

The hardness of the true glass surface of the block resists vandalism and accidental injury to the surface. It can be readily washed and cleaned with soap and water. The lustre is permanent. It is being marketed under the name, "Glasface."

In anticipation of much interest from the concrete block industry in this far reaching development, Max Miller and his associates in the United Cement Products Co. have established a policy of welcoming visitors from the industry to see the plant and have the operations fully explained. A trip also discloses interesting developments in concrete products plant control by laboratory and mechanical installations. The use of exposed concrete block in a wide range of patterns and colors in the concrete products company office interior is an inspiring sight and a splendid example of the great progress that is occurring in this field. Because of the many requests for samples of the new material, 3- x 3-in. sections cut from "Glasface" block have been prepared and are available at $1.00 each to cover costs of handling, cutting, and mailing, by addressing United Cement Products Co., Wichita, Kan.

Open Joint Offices

MO-KAN CONCRETE PRODUCTS ASSOCIATION and Unit Masonry Association, Inc., Kansas City, Mo., have announced the opening of joint offices at Room 1207, 922 Walnut St. Tip Brown is in charge as secretary-manager.

LABOR Problems In the Ready-Mixed Concrete Industry

By JAS. A. NICHOLSON*

25: A producer views the ready-mixed concrete business

IN THE PREPARATION OF A LABOR CONTRACT, the following matters should get careful consideration:

1. *Provisions Covering Hours of Work and Overtime.* Stay away from any guarantee of a stated work day or work week. Check the overtime policies of competitors and companies in somewhat similar lines. Don't allow yourself to be pushed beyond these standards. Because some of our sales involve us with Federal labor regulations, most organized ready-mixed concrete companies have agreed to the payment of time-and-a-half over 40 hr. Oppose any consideration of penalty double-time. Clearly spell out the agreement on holiday work and other premium time duties so as to prevent the possibility of any union interpretation that would pyramid holiday rates or other overtime pay.

To avoid confusion and mistakes, it is good policy to include all employer obligations on work days, straight time work, straight time and overtime pay, "call-in" pay, paid holidays and even vacation commitments in one section.

As to paid holidays, the following are suggested:

(a) Aggressively resist paid holidays on the basis of seasonal work.

(b) If forced to accept paid holidays, limit obligation only to holidays falling within regular work week. If you are working a 5-day week, you would not pay for holidays falling on a Saturday.

(c) Deny inclusion of New Years and Christmas on the grounds that this industry, operating at a loss during winter months, is already providing much nonproductive work to year-around employes.

(d) If your contract calls for payment of Christmas and New Years, make it clear that "laid-off" employes do not get this extra compensation.

(e) Specify that men on vacation during the Holiday period (December 24th through January 1st) will only be entitled to one holiday payment.

2. *The Grievance Clause.* The contract should provide procedure for the prompt, efficient handling of grievance matters whether initiated by the company, employe, or the union. Carefully define what constitutes a legitimate grievance. Don't leave the door wide open for the steward to throw his weight around the plant. (Require close checking of the time this employe representative spends on grievance matters).

Limit the steps in grievance procedures. Insist that the aggrieved employe first contact your foreman or other responsible key man. At this level, most grievances should be promptly settled. In the comparatively small companies of our industry, a second step should suffice with the steward, a union official and you (or your representative) added to the discussion. It should be a prerequisite of the meeting that a written complaint be made of the incident. Get a written report of both meetings. Demand that the decision be put into writing. Permit no time interval to elapse that will add to the problem. Be cautious about taking matters to arbitration.

4. *Arbitration.* The contract should adequately provide for arbitration of disputes involving interpretation or alleged violations of the agreement. Arbitration provides an orderly basis to determine what a contract actually means and is a peaceful means of enforcing compliance upon a recalcitrant party. In facing labor disputes, it is generally wiser to conciliate and arbitrate rather than to so conduct your own actions that a strike is inevitable. In most cases, arbitration has proved preferable to the use of economic force.

Adopt a practical arbitration clause. Carefully limit its use to only misinterpretation or violation of the contract. Stay away from the possibility of costly awards to the employe or employes by insisting upon a short time limit for the arbitrator to report a decision. Be extremely careful in the selection of an arbitrator. Specify either a single arbitrator or a three-man panel. Because both sides are given representation, many prefer a three-man panel.

For companies of the size generally found in our industry, the arbitration clause, because of costs involved, is seldom invoked. To hold the use of arbitration to a minimum, insist that the union share the expense of providing an arbitrator. If you are able to get the union to accept cost-sharing the chances are that you and the union will work out most differences without the aid of a third party.

On matters that are submitted to arbitration, the selection of an efficient arbitrator, together with a full and complete presentation, should insure that the decision will go to the party that was right all along. Unless such an ending generally develops, one of the parties was careless in the selection of the arbitrator and the presentation of his case.

The future of arbitration depends on the full cooperation of concerned parties.

4. *No Strike Clause.* Make every effort to include a "no strike" clause that clearly prevents the authorization of strikes, work interferences or lockouts during the life of the agreement.

5. *Seniority.* The seniority clause should be written in clear concise language both to protect the worker with a long service record and at the same time give the producer such necessary controls over promotion, transfer and demotion that will permit the development of an efficient operation. In setting up seniority standards in the ready-mixed concrete industry, insist on four classifications:

(a) Plant men
(b) Yard help
(c) Truck-mixer operators
(d) Dump-truck drivers
(In some operations, this group may be classed with Yard help)

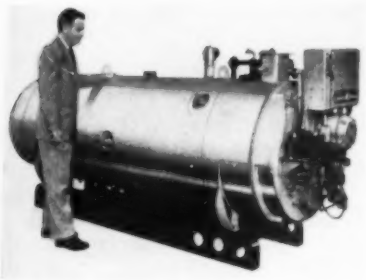
In our work, certain definite capabilities and qualifications are required for these different work classifications. Under no conditions, permit a lower rate employe to bump a higher paid, more capable worker; e.g., a dump-truck driver to bump a truck-mixer operator. If you are a multiple plant operator, work out an acceptable combination seniority program. Resist each

(Continued on page 148)

Note: Check your lay-off plans in November and give separation or lay-off slips early enough so that "laid-off" employes won't be claiming holiday compensation.

*Pres. Nicholson Concrete Co., Toledo, Ohio.

NEW MACHINERY



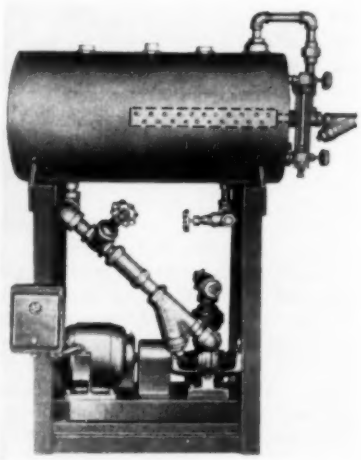
Self-Contained Boiler

CLEAVER-BROOKS CO., 326 E. Keefe Ave., Milwaukee, Wis., has announced the "CB" packaged boiler unit in capacities ranging from 15 to 40 hp., for processing or heating, steam or hot water use. A "Fireye" electronic combustion safety control is standard equipment on the boiler, which also has hinged doors on the front and rear for maximum operation and maintenance accessibility. It burns gas or oil, and it is said to be converted from one fuel to the other in less than a minute. Because it is constructed as one integral unit, it requires a maximum of 5 sq. ft. per boiler hp. The operating and safety controls are easily accessible with the burner components mounted on the front head. Greater head absorption is claimed due to the four-pass construction, and minimum efficiencies of 80 percent are guaranteed by the manufacturer when firing with oil.

Fork Lift Truck

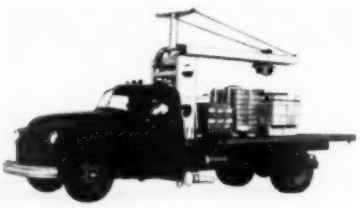
LAMSON MOBILIFT CORP., Portland, Ore., has added the "M-324" fork lift truck, with 3000-lb. capacity at 24-in. load centers, to its line. The truck features "Mobil-Matic Drive" consisting of a heavy duty, oil immersed, multiple disc clutch, a constant mesh transmission and a fluid coupling. The unit has a push-pull forward-reverse lever, an accelerator and a brake pedal, eliminating the clutch pedal. The truck has two speeds forward and two reverse.

Another feature, known as the "Hydra-Lizer," consists of equalizers mounted on each rear wheel and connected hydraulically to cross-compensate the truck when the front or rear wheels pass over bumps or depressions. The wheelbase is 42 in. and the overall length, less forks is 72⅞ in., giving the truck a short turning radius of 72 in. A 4-cylinder gas engine powers the unit. A telescoping mast with ball bearing rollers and a displacement type, triple-section lift cylinder are incorporated on the truck. The standard mast is 83 in. overall with a lift height of 128 in. and a free lift of 64 in. Other masts are available, including a 68-in. overall height model for operation in truck bodies, vans and other low clearance places.



Boiler Feed System

UNITED STATES RADIATOR CORP., Cyclotherm Div., Oswego, N. Y., has added a boiler feed system, incorporating a pre-heater which operates on steam from the boiler, to its line for use in conjunction with Cyclotherm and other steam boilers. The units are designed to automatically maintain boiler feed water between 190 and 200 deg. F. Tank sizes are available in a range of sizes from 30 to 540 gal., and will supply from 280 to 2800 gal. of preheated water per hour. A perforated tube inserted horizontally in the feed water tank is connected to the steam supply. The unit is thermostatically controlled so that steam is allowed to enter the unit only when the temperature falls below a predetermined point. A thermostatic bulb filled with a pressure-sensitive fluid controls a flexible bellows that mechanically opens and closes the valve, varying the opening or completely closing it.



Truck Crane

TRUCK-CRANE, INC., 130th and Halsted St., Chicago 27, Ill., has brought out the Truck-Crane, a self-contained, materials-handling crane which has a lifting capacity of 5000 lb. It loads and unloads within a 16 ft., 280 deg. radius of the truck. A traveling carriage on the boom spots the loads, and when unloading, outriggers are utilized to stabilize the truck. The complete mechanism is hydraulically controlled, with boom, winch, carriage and outrigger controls located on panels at both sides of the truck. Two models are available: the HB-50, horizontal boom, with optional boom lengths up to 16 ft.; and the EB-50, equipped with a telescoping elevating boom with extensions up to 22 ft.

Cementing Compound

THE BERYLEX NATIONAL SALES CO., Reno, Nev., has announced Berylex, a chemical cementing compound for use with portland cement, but not with waterproof cement or plastic cement. Advantages claimed for the compound include: increased ultimate strength; high early strength; internal and self-controlled curing; faster hardening; and extra surface and internal hardness. It is also said to have the qualities of air entrainment as to durability and workability; bonds new concrete to old, or old concrete to old concrete.

Block Height Control

BERGEN MACHINE & TOOL CO., INC., 189 Franklin Ave., Nutley 10, N. J., has announced an automatic height control, the "Zeromatic," for Tri-Matic and Vibrapac concrete block machines. It is said to automatically adjust the cut-off bar, when more or less material is required in the mold, without stopping the machine unless a gross error has been made in mixing. In such instances, the machine stops while the block is vibrated to size, during which time the cut-off bar is raised or lowered proportionately.

• Experience at Anchor Concrete Products, Inc., Buffalo, N. Y., and other recently built plants points to the advantage of large diameter autoclave cylinders. Complete conversion to autoclaved products is most efficient

By JOHN K. SELDEN*

A 10- x 90-ft. autoclave with three reinforcing rings to prevent collapse from vacuum

Designing Efficient Autoclave Plants

PIONEER "AUTOCLAVERS" used contoured racks to pack the maximum number of blocks in converted 6 ft.-6½ ft. dia. sand-lime brick autoclaves (see ROCK PRODUCTS, September, 1954, p. 135). Ingenious Christmas tree or cantilever type racks were developed which gave efficient space utilization but required cars or small, rather slow moving lift trucks, and did not lend themselves so well to mechanical loading devices. This made for higher labor costs. Recently such producers of autoclaved concrete products as Messrs. Harter, Brooks and Reinhold, have stressed labor efficiency in loading and moving racks, and have built new, larger cylinders to fit existing rectangular racks thereby sacrificing space efficiency and greatly increasing investment in autoclaves.

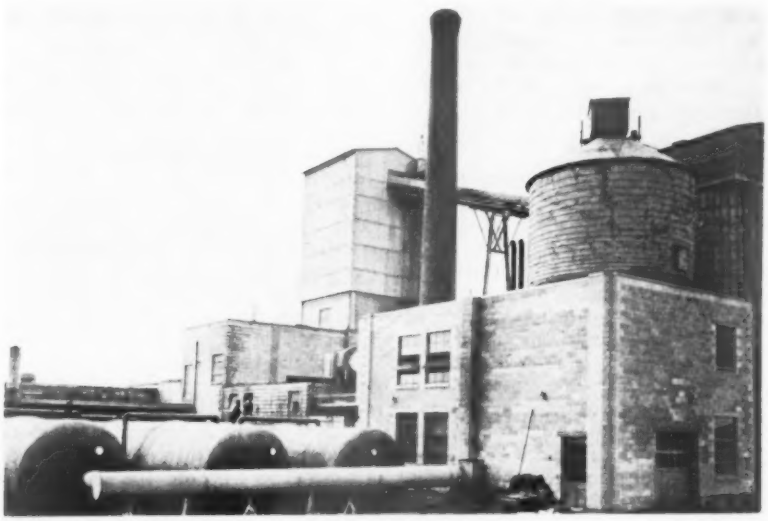
Many suggestions have been made for building rectangular autoclaves to fit rectangular racks, but calculations show the costs would be excessive due to heavy reinforcing ribs on all sides. Space efficiency means building racks to fit the contour of the cylinder. Combination of space efficiency with labor efficiency requires the development of new pallet loaders which can feed two, three of four pallets at a time since the most efficient contoured racks are side loading. The writer has been trying to interest leading manufacturers of block machines to develop such loaders.

Advantages of Large Diameter

Fred Reinhold, president of Anchor Concrete Products, Inc., Buffalo, N. Y., explains that two large lift trucks with 108-block racks can handle the production of three Besser machines while it would take three trucks and operators to service the same machines with 72-block racks. The saving of one operator and the hoped for salvaging of existing racks prompted him to order 10 ft. autoclaves. (Actually, all new racks were built to incorporate chamfered corners to provide safe clearances when entering the 10-ft. door.) Since these six-tier racks are already as high as can be conveniently loaded by present equipment, and as heavy as can be carried by the Hyster 8000-lb. trucks, larger racks and cylinders of still greater diameter are not likely to prove economical, and the 10-ft. autoclaves are likely to remain the largest.

Efficiency-wise, the main advantages of the larger diameter are a slightly lower cost per cubic foot of capacity, and reduced surface area per cubic foot of contents which means less corrosion, less heat loss and lower insulation costs per block. On the other hand, factors such as continuity of operation, uniformity of precuring time, reuse of steam, stabilized demand on boilers and increase in number of curing cycles per day all favor smaller cylinders and more of them.

*Consultant on autoclaving.

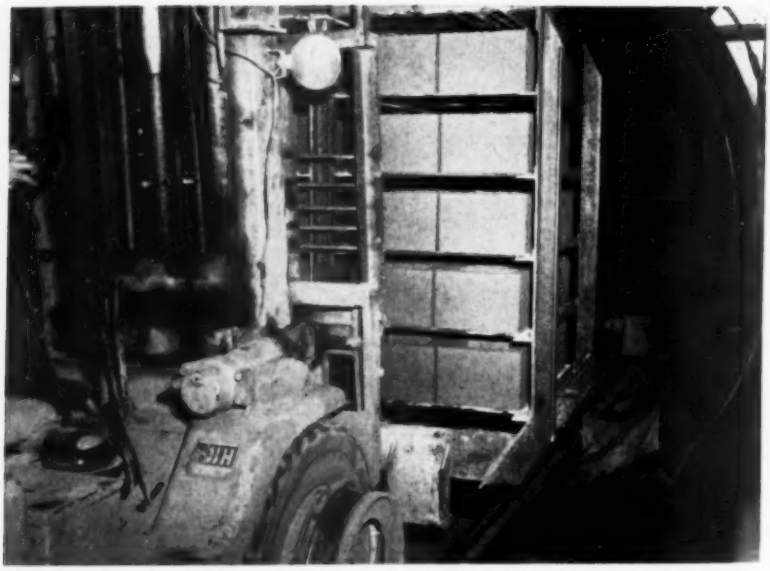


Autoclave installation, rear view, showing weather-proofed insulation, 12-in. exhaust valves, duct and fan, and new boiler room with coal silo above

Design of Autoclaves

The three 10- x 90-ft. Anchor autoclaves, designed for 155 p.s.i., are fusion-welded of 70,000 p.s.i. steel and weigh 110,000 lb. each or about 27,000 lb. less than if built of common 55,000 p.s.i. boiler plate. This makes for lower first cost, lower freight and less steel to heat and cool each cycle. These advantages outweigh the slight disadvantage of higher proportionate thickness for corrosion allowance.

Each autoclave is provided with two 12-in. flanged outlets; one on top to provide for future installation of a vacuum connection, if needed, and one in the rear for exhaust. Since experience has shown that a rapid blow-off cycle will dry lightweight aggre-



Four-ton lift truck loaded with 108-block rack rides with flanged outside wheels across rails of movable bridge at entrance to autoclave

gates like expanded slag down to a 10 or 20 percent moisture content and dense aggregates down to 5 or 10 percent, based on total absorption, the vacuum outlet will probably never be needed. The 12-in. gate valve at the rear, however, is used twice each cycle. While loading, an exhaust fan connected by ducts to these valves on all three cylinders pulls a current of air through the open cylinder to remove lift truck fumes and protect the operator from excessive heat. With mechanical charging, these 12-in. outlets would be unnecessary.

The autoclaves are insulated on the outside with 2½ in. of fiber glass covered with a weather-proof coating, the front end only being under a roof. Thicker insulation to increase heat economy would be justified only if lower installation costs could be obtained. Insulation on the front door is held on by studs welded to the head and by a sheet metal covering. Without such precautions, doors are difficult to insulate.

Power Plant

A brand new boiler room with a 200 p.s.i. Tycotherm boiler of 300 hp. rated and 600 hp. actual capacity was installed with all necessary blowers, water softeners etc. An overhead 100-ton coal silo feeds the Detroit Stoker with relatively little manual attention. Automatic controls go far to maintain smooth operation, but sudden peak demands make highest efficiency difficult. If too great a load is thrown on the boiler all at once, which sometimes happens during the night shifts when high temperature and high pressure block and Flexicore kilns are all cut into the line at the same time, boiler pressure, set at 150 p.s.i. may drop. Autoclaves already up to their 145 p.s.i. floating pressure will then bleed steam back into the line. This can be prevented by some kind of a check valve in the cylinder supply line, by use of a steam accumulator, by operating the boiler at a higher pressure with a reducing valve, and of course, by careful scheduling. These considerations suggest that a boiler should be selected with a maximum pressure rating somewhat above that at which the autoclaves will operate, and to provide for peak demands and future autoclave additions, an oversize installation is desirable since in heavy duty boilers up to 20,000 lb. steam per hour, additional capacity costs very little. Any block plant faced with buying a new boiler should select a high pressure type to avoid the necessity for replacing it when and if a conversion to autoclaving is made.

Capacity and Cycle

Anchor's three cylinders each have a capacity of twenty-five 108-block racks or 2700 block twice a day. This gives a total autoclave production of only 16,200 daily or approximately half of the summer output, the remainder being high temperature cured. To high pressure steam cure the entire production, additional cylinders would have to be ordered or else the capacity of the present units increased by contouring and mechanization. This latter approach would not be economically attractive for several years until present brand new racks and lift trucks had been depreciated. Additional cylinders are more likely to be ordered.

Experience at Anchor Concrete Products, Inc., as elsewhere has demonstrated that freshly made units if charged into the autoclave at once and exposed to immediate steaming develop crazing and decrease strengths. Allowing the racks to stand in the autoclave for their preset, lengthens the cycle by delaying start of the steaming. Tying up a $35,000 piece of equipment simply as storage space is not economical. Hence, racks are first deposited in the old high temperature kilns until the last one is a couple of hours old and then taken into the cylinder where the door can be closed and the steam-bleeding air-exhausting phase of the cycle started immediately.

The present curing cycle requires 12 hr., with 5 hr. constant steaming at 145 p.s.i. The other 7 hr. are utilized in heating and cooling, charging and discharging the autoclave. To increase curing efficiency by 50 percent to realize three instead of two cycles a day would, as in the case of increased space efficiency, require drastic changes to allow the necessary mechanization. Consideration of such changes again has been postponed until present racks and lift trucks have been depreciated.

Operation and Maintenance

1. Starting with the cylinder under full pressure, a 4-in. valve is opened and steam is blown off for ¾ hr. to give dry blocks.

2. The large 12-in. gate valve at the rear is opened to allow for rapid exhaust of the last few pounds of steam.

3. When the safety devices "sense" that all steam pressure has been released, a guard is automatically raised over the ratchet which allows the locking ring to be expanded and the 10-ft. pressure door opened.

4. The exhaust fan is then turned on to remove the vapor and cool the cylinder and its contents.

5. One of the two transfer bridges is then rolled into place and locked in line with the autoclave rails (see illustration).

6. A piece of belting or canvas is then spread over the lower mouth of the cylinder so as to protect the locking ring and gasket from the falling grit which could easily prevent the pressure door from sealing.

7. The empty lift truck then approaches this bridge head-on so that the weight is gradually transferred from the rubber tires to the flanged wheels as they contact the tapered rails.

8. When the 25 racks of cured block are replaced by those holding "green" block 2 to 4 hr. old, the accumulated grit is swept out, the sealing surface wiped clean, and the door closed by the suction fan. Not until the locking

ring has been closed all the way can the steam be turned on. Air is then exhausted as it is replaced by water vapor, and an effort is made to sweep out the remaining air before closing the rear valve so as to reduce oxygen corrosion. Full pressure is reached in approximately 3 hr. and maintained for 5 hr.

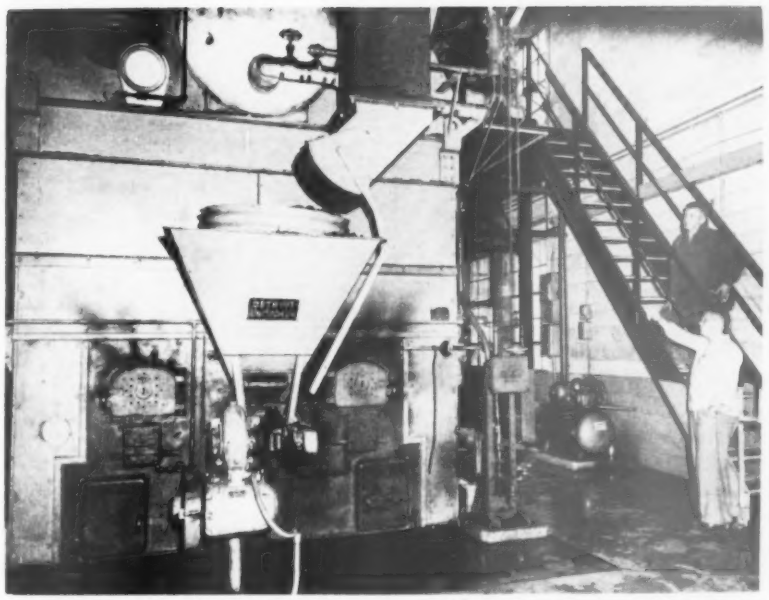
To prevent or at least greatly retard what at first appeared to be serious corrosion of the steel cylinder and racks, a film forming chemical is now being supplied through the steam line. This treatment appears to be effective for the cylinders, but the racks, which still appear subject to corrosion are painted every month or two with a lime - cement - silica - asbestos slurry which hardens in the autoclave. A more economical dip treatment is contemplated. While previous failure to exhaust all the air may have contributed to the original corrosion, it is felt that sulfides in the aggregate may accelerate the action. For this reason, all autoclave plants using any aggregate which may contribute to corrosion should consider the necessary protective treatments.

Cementitious Materials

Previous articles in this series have stressed the importance of including siliceous materials as replacements for or as additions to portland cement. They have also pointed out that lime-cement blends may give more consistent results, particularly with fly ash and that 10 percent hydrated lime is used in several plants to increase cohesiveness. Experimental and production results at Anchor Concrete have confirmed many of these findings, some of which are reported in tabular form at the end of this article. Following is a summary of the results.

1. Fly ash from Chicago, Detroit and Buffalo, all with high surface area and with carbon contents averaging 4 percent or less, gave excellent results.

(a) With expanded slag aggregate, optimum strengths and freedom from core bar cracking were obtained when half the cement was replaced by fly ash. The 50 percent fly ash blocks gave compressive strengths 60 to 80 percent higher than the same units with 100 percent cement autoclaved at the same time. The 50 percent fly ash strengths varied from 1500 p.s.i. for all slag to 1900 p.s.i. for sanded slag. Block made with expanded slag are more dependent for autoclave strengths on the replacement of 30 to 50 percent of the cement with a siliceous material than block made with any other aggregate. Full size block tests have confirmed previous laboratory findings that with autoclaved slag units, fly ash gives as good strengths as silica flour.



Grant Reinhold and Walter Kratzke inspect new 200 p.s.i. heavy-duty boiler rated at 300 hp., and capable of delivering 600 hp., with automatic stoker and controls

(b) With sand and gravel units, a lower percentage of fly ash, 25-40 percent, gives optimum results. A large order of 40 percent replacement units, shipped 70 miles to a neighboring city, at a 5-cent a block premium for autoclaving and hauling, won high praise from the contractor and architect for quality and appearance. Three-day strengths of the block were 2400 p.s.i.

(c) Appearance of the block made with fly ash, is controlled by the percentage of carbon in the fly ash and of fly ash, lime, and water in the mix. High carbon fly ashes are objectionable where appearance is an important factor. Even 8 percent carbon may reduce the color appeal of a light sand, limestone, or expanded slag unit, but would not be objectionable in a cinder unit. With low carbon fly ashes, 4 percent or less, a light blueish-grey pastel shade is imparted which is rather pleasing. At first, Anchor Concrete hesitated to darken its light colored units which had always enjoyed sales appeal due to appearance. However, favorable customer reaction to Anchor's new "powder blue" autoclave block is encouraging management to use fly ash to an even greater extent. Availability locally of new low-carbon fly ash with small daily variation in color value, makes this possible.

2. Silica flour, which is higher than 99 percent pure silica, has two distinct advantages over fly ash. It is always constant in composition and in color. It whitens instead of darkens all high pressure steam cured products. Strengths with sand and gravel units are higher for silica than for fly ash replacements but approximately equal for slag. Volume change measurements made previously at University of Toledo indicate that shrinkage is about the same for both.

3. Hydrated lime in the mix has two distinct values; it improves the cohesiveness of otherwise harsh, lean autoclave mixes, thus reducing core bar cracking and increasing resistance to traffic hazards, and it gives a lighter color. Thus, in the 50 percent fly ash block discussed above, those with 50 percent cement and those with 40 percent cement and 10 percent lime (based on CaO) gave equal strengths, but the lime-containing mix was a shade lighter and was the one selected by the foreman out of eight mixes as the best for block making qualities — the other seven contained no lime.

While hydrated lime was used in all experiments, it was calculated on the basis of quick lime which it is believed would be more economical for a large operation. Since 4 lb. of hydrated lime equals roughly 3 lb. of quick-lime plus 1 lb. of water, allowance for the water was made in the weighing out the hydrate.

4. Cement in all cases was standard type I either with or without air. While high-early-strength cement helps the products to set up stronger in high temperature curing, it is not considered to help much with autoclaving. The only tests conducted by the author some years ago showed substantially equal strengths for both.

From the above it is evident that any high pressure, steam cured products plant designed to take the fullest advantage of the potential savings in

Floyd Runyon explains to Bill Schiesel how boiler room recording instruments help improve combustion efficiency

the process should have a special cementitious materials bin included along with autoclaves and boiler. Ideally this should have at least four compartments, each with a capacity of two carloads, unless materials are trucked in from local sources. Cement, powdered quick lime, fly ash and silica flour can all be shipped in covered hopper bottom dump cars, discharged to a below-track hopper and delivered by Fuller-Kinyon pump, Airslide or other conveying means to each of the four bins. Bagged hydrate or lump lime would require separate consideration.

All the above materials have one thing in common, they are dusty and require dust tight chutes, a covered mixer and a flexible boot connection from weigh-larry to mixer. Fly ash is much dustier than cement, hence by using an exhaust fan to maintain a slight suction on all hopper-to-mixer connections, both the fly ash smoke and silica hazard can be easily eliminated.

Autoclaving Half of Production

Anchor's experience in high pressure steam curing only half its output has demonstarted a number of problems arising from partial conversion.

1. Different mixes must be used and kept separate. If the one without silica or fly ash is autoclaved and the one with the addition is high-temperature cured, both will suffer in quality.

2. Different racks are used.

3. Color value varies with curing method.

4. The varieties of block in the yard may be doubled or nearly so since inventories have to be stocked both in high temperature and high pressure cured.

5. The work of the shipping department is complicated and careful records must be kept if future performance of high temperature cured units is not to be confused with that of high pressure cured units.

6. The cost of boiler and firemen is the same for half as for full autoclaving. Hence the former is less economical.

To avoid confusion and lowered economy, conversion should be complete

Cost Factors

The most conspicuous savings due to autoclaving comes from:

1. Premium price for quality.

2. Replacement of higher price cementitious materials with lower price ones or with by-product materials like fly ash which can usually be delivered for $3 a ton or less.

3. Elimination of the cost of separate drying kilns when dry blocks are required.

4. Reduction of inventory and required storage space made possible by the fact units can be shipped the day after making. The savings vary for each plant and can be determined only after an experimental program with the local materials involved.

The principal sources of increased cost are:

1. Interest and depreciation on investment.

2. Increased fuel costs — if any.

3. Cost of licensed firemen around the clock.

While it is too soon to analyze Anchor's savings and costs in detail, a few comments can be made.

Experience shows that with suitable education and promotion, high pressure steam cured units may bring a premium for quality and/or enhance competitive position. Use of fly ash, — if and when a high quality product is available locally, and elimination of a separate drying operation, — when and if architects are educated to specify dry blocks, should result in additional savings.

On the cost side, charges on Anchor's quarter million dollar investment amount to quite an item. However, with efficient design, particularly in a new plant or one in which it is not necessary to tear down old structures, the capital investment can be markedly reduced. The cost of coal has not increased greatly because the increase in tonnage has been just about balanced by the lower price per ton made possible by the new 100-ton coal silo and the purchase in carload instead of truck load lots. When at some future date facilities are installed to partially recover the heat content of blow off steam in addition to the excellent condensate heat recovery method already installed, still further savings may result in a net saving in coal costs. The four firemen and chief engineer at Anchor add $1400 a month

(Continued on page 144)

Effect of Mixing and Vibration Time on Autoclaved Lime, Cement, Silica Brick

Exploratory Run at Anchor Concrete Products, Buffalo, N. Y.

Mix by weight 1:7
1 Part blended Cementitious Material
5½ Parts Sand 89 pcf.
1½ Parts ⅜" Slag 69 pcf.

Autoclaved 5 hrs. at 140 p.s.i.
One-third extra hydrate added to give quick-lime equivalent.

2¼- x 3⅝- x 7⅝-in. brick made on end in Besser Vibrapac

Batch No.	Cementious Material, Percent by Weight: Lime	Cement: Grey	Cement: White	Silica	Time of Mixing Min.	Time of Finish Vibra Sec.	Unit Weight Dry P.C.F.	Dry Strength p.s.i.: Modulus Rupture 7 day	Compression Top 7 day	Compression Bottom 7 day	Absorption by Weight %: Top	Absorption by Weight %: Bottom
1	30	30		40	5	3	141.6	585	8,120	6,470	9.2	9.9
					5	7	148.4	925	10,000	8,820	8.2	8.4
					5	10	148.6	785	11,800	11,200	8.0	8.8
2	20	40		40	5	3	141.0	870	8,150	6,490	12.7	9.3
					7	7	156.9	1215	14,500	13,600	7.1	7.7
					10	10	153.0	825	10,850	11,050	7.8	8.0
3			60	40	5	3	153.9	830	11,800	10,500	6.7	7.5
					7	7	156.2	655	13,300	11,150	4.9	6.3
					10	10	156.7	920	11,850	12,000	5.1	5.7

Two bricks tested for each strength value, one for absorption.
Bending tests on 6-in. span.
Compression tests on broken half tested flat on 3⅝- x 3⅝-in. area.
Bricks dried 24 hr. at 150 deg. before test.

High compressive strengths are due in part to:—
(a) Over drying at 150 deg. F.
(b) Testing flat
(c) Modified cube compression technique. Broken ends were tested between 3⅝-in. long plates to compensate for somewhat irregular broken edges.

Members of the Southeastern Regional Association N.C.M.A., Program Committee meeting in St. Petersburg, Fla., to plan the program for the meetings to be held at the Soreno Hotel, St. Petersburg, November 22-23. Left to right: H. A. McGee, Orangeburg, S. C.; Earl Martin, St. Petersburg; Sam Bailey, Jackson, Miss.; E. M. Barnes, Knoxville, Tenn.; Leon K. Camp, Columbus, Ga.; Geo. W. Katterjohn, Paducah, Ky.; Hardy Magrath, Jacksonville, Fla.; Henry Pommer, Memphis, Tenn.; C. I. Needham, Bradenton, Fla.; M. E. Rinker, president, N.C.M.A., West Palm Beach, Fla.; W. R. Ireland, Atlanta, Ga.; and Dick Kerr, Charleston, S. C. were present but not in picture

Southeastern Meeting

ST. PETERSBURG, FLA., will be host to the 11th annual meeting of the Southeastern Regional Association of N.C.M.A. on November 22, 23, and 24 at the Soreno Hotel. Registration will start at 2:00 p.m. on November 21, and business sessions will be held on the mornings of November 22, 23 and 24. The afternoons will be devoted to inspection trips to see the beautiful and varied uses of concrete masonry in the area, and entertainment which will include a beach party, dinner and swimming carnival to be held at the Tides Hotel and a bus trip over the newly opened Sunshine Skyway Bridge to Sarasota and return.

Southern Activities

SOUTHERN CONCRETE MASONRY ASSOCIATION with headquarters in New Orleans, La., has launched an active program of promoting the use of concrete masonry in Louisiana and Mississippi. Recently the association honored members of the Home Builders Association of Greater New Orleans, Inc., during Home Week with a luncheon in the Swan Room at the Monteleon Hotel. Gilbert E. Olson, vice-president of Builders Supply Corp., Phoenix, Ariz., largest single producer of concrete masonry, was a featured speaker. Fred C. Dent is general manager of the Southern association.

Concrete Retaining Walls

THE NATIONAL CONCRETE MASONRY ASSOCIATION has published a booklet entitled "Reinforced Concrete Masonry Retaining Walls," containing recommendations on the design and construction of reinforced concrete masonry retaining walls for wall heights up to 10 ft. Sample calculations illustrating the methods and procedures for the wall designs, and a report of load test results are included.

Left to right: Ellie H. Schill, president of Home Builders Association; Congressman F. Edward Hebert; Gilbert Olson, and Herbert Jahncke, president of the Southern group

COMMENT

from the

BUTLER ENGINEER

. . . of orchids to the Corps of Engineers . . . and automation

A very forward-looking and alert Corps of Engineers has kept the desk lights burning for many weary nights to bring forth definite and definitive spec's covering the production of Ready Mixed Concrete. This move, greatly needed, is of vast importance to the Ready Mixed Industry for it provides absolute clarification of what kind of plant or what kind of job as a basis for bidding on civilian or military work supervised by the Corps.

Automation of Ready Mixed plants is going to be required in certain contract classifications. Your Butler Engineer promises that Butler Bin will help you meet the new specifications by revising your existing plant . . . and by engineering new plants to the requirements.

At any rate, orchids and a sweeping bow to the Corps.

Speaking of plant automation, and this applies to Road Builders as well as Ready Mixed plant owners, I often wonder what your batch operator thinks when he goes home with protesting muscles, aching back and tired mind and, over the suds (soap, of course) contemplates what is provided his wife in her household work. Consider: automatic dishwasher, automatic heating, automatic toaster, automatic refrigerator defrosting, automatic cooking, automatic water heater, even automatic music to wake up. And he drives a car with automatic shift and automatic dimmers on the lights.

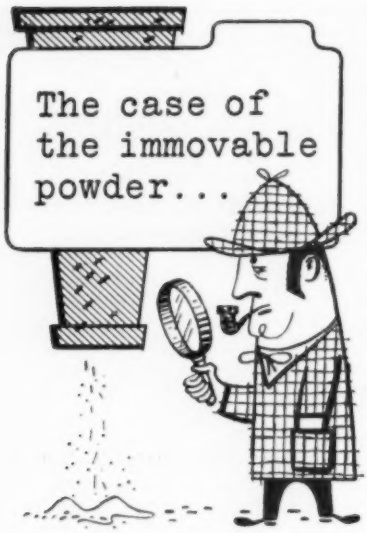
The moral? Plant automation pays . . . in higher production . . . better quality . . . greater profits . . . happier owners . . . happier operators . . . happier customers.

Yours — automatically,

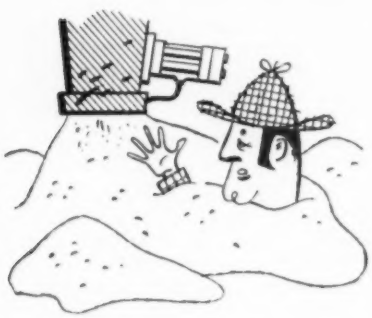
The Butler Engineer

BUTLER BIN COMPANY

WAUKESHA, WISCONSIN



This case came to a head in a New York cosmetic plant. Keeping dry powder moving through the bins and drums without costly jam-ups was a real problem.



We're happy to say a CLEVELAND vibrator on each bin and drum was the ideal solution. In no time at all production delays became a thing of the past.

Tell us your materials handling problem, or ask for our detailed literature.

AIR *and* ELECTRIC

2708 Clinton Avenue • Cleveland 13, Ohio

Designing Autoclaves

(Continued from page 142)

to the payroll and represent one of the largest costs.

Summing it all up, the cost of building and operating a high pressure steam curing products plant will vary inversely to the adequacy of the engineering and experimental work behind it.

Small Portable Autoclave

In response to numerous requests and to assist prospective autoclavers in finding out in advance just what autoclaving will do for them in the way of improved quality and reduced material costs, the writer is building a small portable autoclave and steam generator which will make several dozen block at a time. This little pilot plant can be wheeled into any products plant so the owner can watch the autoclaving of blocks made with his own aggregates on his own machine. Local architects, engineers and contractors can be invited to witness the process and the tests. From the results, a prediction can be made of correct formulation for local materials, potential yearly savings, investment cost and advisability of proceeding with autoclave plant designs. The accompanying advisory service will endeavor to spare the prospective autoclaver some of the expensive headaches which previous pioneers in the process have had to pay for and to give him the benefit of the many lessons learned here in Buffalo, N. Y., at Anchor Concrete Products, Inc.

Effect of Mixing and Vibration Time

(See Table on page 142)

REPLACEMENT of 40 percent by silica has little effect on problems of mixing and vibratory placing except that a dust collecting system is essential because of the potential silicosis hazard with silica flour and that blending of cement and silica prior to introduction in the mixer would be desirable even if not necessary.

In the case of lime and fly ash, however, new properties of the mix are introduced. Small percentages of lime and larger percentages of fly ash tend to give otherwise harsh lean cement mixes a fatness or cohesiveness which reduces core-bar cracking and facilitates handling of the green block. But as the percentage of replacement, or even addition increases, the mixes become stickier and more difficult to feed and compact by vibration. Sand-lime brick manufacturers have long depended on pressure instead of vibration and, blockmakers attempting to use straight sand-lime or fly ash-lime mixes without coarse aggregate have found they had to depend on old-

Your Customers will say...

when you offer them a choice of

23

DIFFERENT CEMENT & MORTAR COLORS

Made by Williams, this is the broadest selection of fine Cement and Mortar colors on the market. By offering your customers a choice of 23 shades, you can quickly and easily settle upon one having the exact chemical and physical properties your color specification requires.

CEMENT COLORS BY WILLIAMS

Here you have a choice of 18 shades—6 Reds, 3 Greens, 3 Browns, 3 Yellows, 1 Black, 1 Blue, and 1 Orange. Each shade is manufactured to meet the most exacting specifications for cement work—as recommended by the American Concrete Institute and the Portland Cement Association.

MORTAR COLORS BY WILLIAMS

Here you have a choice of 5 different shades—one shade in double strength red, light buff, dark buff, chocolate and black. Each of these colors may be used with excellent results with any standard mortar mix or with a ready-made Bricklayer's Cement.

Write today for color samples and complete technical information on how Williams Cement and Mortar Colors give you superior results. Address Dept. 10, C. K. Williams & Co., Easton, Pennsylvania.

WILLIAMS
COLORS & PIGMENTS

C. K. WILLIAMS & CO.
East St. Louis, Ill. Easton, Pa. Emeryville, Cal.

fashioned tamping machines in place of the modern high speed vibratory machines, thus sacrificing production.

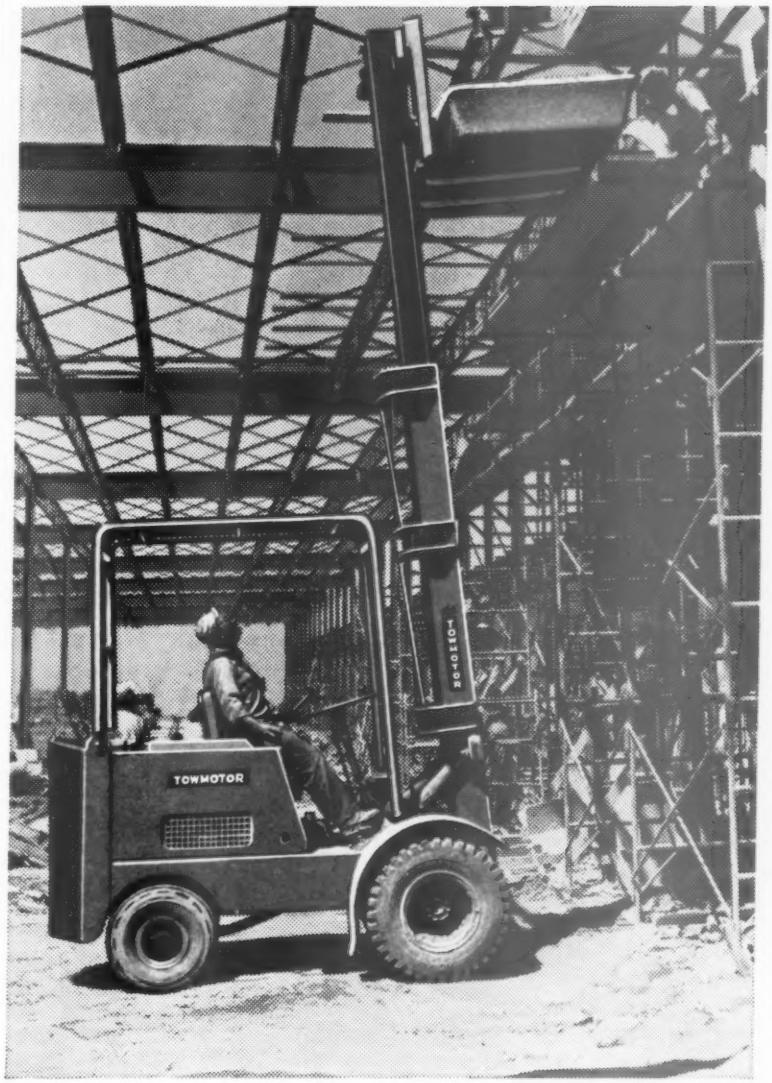
In an effort to meet an architect's requirement for a white or light colored brick, two lime-cement silica and one white cement-silica mixes were run with various mixing and vibration times as shown on page 142. After autoclaving, the bricks were taken to the Research Foundation of the University of Toledo for evaluation. The results indicate that very high quality and light colored lime-containing units can be made in a vibratory machine if a little extra time is allowed.

Analysis of Data

1. In every case the top half of the brick, closest to the applied pressure, was stronger than the bottom half, except for the longest mixing and vibration times when they became approximately the same.
2. Compressive strength, bending strength and unit weight showed marked increases when vibration time was doubled or mixing time increased by a half. Still further increases in mixing and vibration time gave a few reverse trends, due perhaps, to the drying out of the batch in the prolonged experiment.
3. Lime-containing mixes tended to be fatter and slower to place so that extra mixing and vibration time was more necessary for increasing strength and homogeneity than with straight cement-silica mixes.
4. While conditions were not strictly comparable, the results indicate that at the standard 5-min. mix and 3-sec. finish vibration time, the white cement-silica mix which placed easily was strongest but that with a little extra mixing and vibration to ensure proper placement, the optimum lime-gray cement-silica ratio gave the best result.
5. The best brick, made with 20 percent lime (as CaO) 40 percent gray cement and 40 percent silica, mixed and vibrated about half again as long as usual, developed a bending strength (modulus of rupture) of 1200 p.s.i., a compressive strength in the top half of 14,500 p.s.i. and in the bottom half of 13,600 p.s.i. and an average absorption of 7.4.
6. At equal strengths, the lime containing mixes showed slightly higher absorptions.
7. After autoclaving, the lime-gray cement-silica brick appeared as light in color as the white cement-silica brick.
8. Due to very limited number of

(Continued on page 148)

NEW IDEA



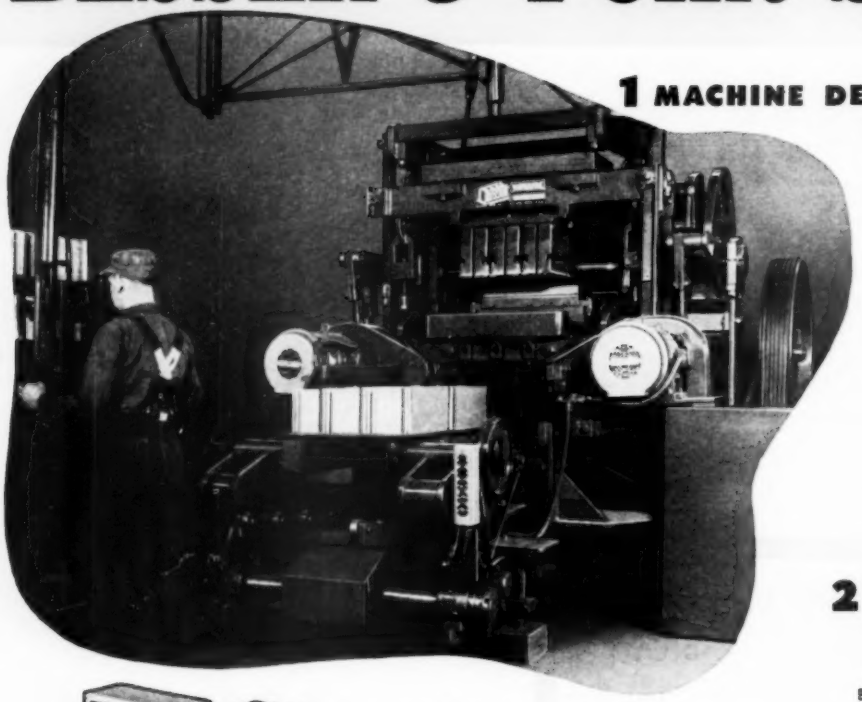
GOING UP... 1/2 ton of mortar!

Making light work of heavy lifting is Towmotor's job here . . . delivering a half ton of mortar to the work level in seconds. Your handling problem, inside or outside, can also be solved with Towmotor efficiency. Your nearby Towmotor representative is a materials handling specialist. Have him analyze your materials handling needs or write for special Job Studies covering *your industry*. TOWMOTOR CORPORATION, Div. 4911, 1226 E. 152nd St., Cleveland 10, Ohio.

TOWMOTOR
THE ONE-MAN-GANG ®

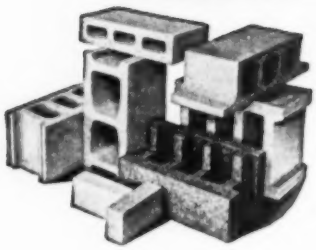
FORK LIFT TRUCKS and TRACTORS
Since 1919

BESSER 9-Point Service .



1 MACHINE DESIGN and DEVELOPMENT

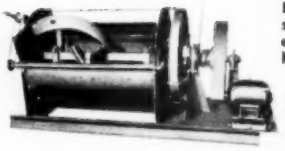
Besser made the first concrete block machine over 50 years ago. Since then, Besser's major service to the Concrete Block Production and Building Industries has been a continuing program of improvement in concrete block and block-making equipment. Additional constructive Besser services, rising from this "foundation service" of Machine Design and Development, are helping VIBRAPAC Concrete Block Plants to produce more and better block at substantial profit.*

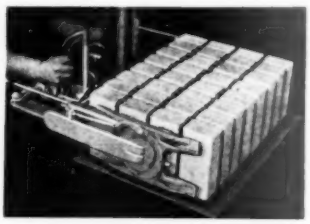


*Today, many Concrete Block Plants are making up to 120,000 block per day with multiple VIBRAPAC Block Machine installations . . . using one set of Plain Pallets for block of all sizes and types.

2 COMPLETE LINE of ATTACHMENTS and ACCESSORIES

Besser VIBRAPAC Machines are always "star performers" in concrete block plants, but Besser also provides a complete "cast" of supporting equipment . . . Besser Batch Mixers (50 cu. ft. model shown here), Lift Trucks, Hoists, Racks and other specialized units.





The Besser Brick Clamp is another vital accessory, for fast, safe handling of concrete brick . . . as shown at right, clamping 32 brick made on a Plain Pallet.

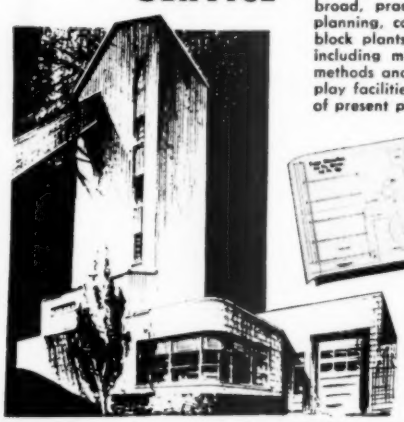
BESSER is the world's leading manufacturer of concrete block machinery and equipment

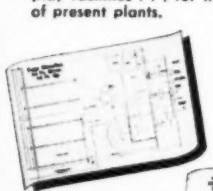
Leadership in pioneering new concrete block machines and production methods has just naturally won for the Besser company the No. 1 position in this industry. VIBRAPAC Block Machines with daily capacity of 7500 units per day are evidence of progress in production . . . and recognition of the advantages of concrete block permanence, fire-safety, insulating and sound-proofing qualities, economy and beauty is shown by the fact that

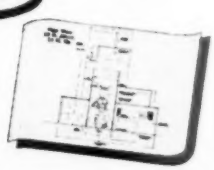
Over TWO BILLION Concrete Block were produced in 1953

3 BLOCK PLANT ENGINEERING SERVICE

Besser provides professional guidance based on broad, practical experience in all phases of planning, constructing and equipping concrete block plants for various production capacities, including material handling and processing methods and equipment, storage and sales display facilities . . . for new plants or expansion of present plants.





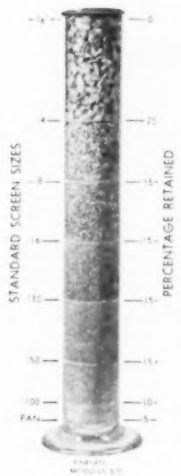


A few of the many practical plant plans available to block producers.

BESSER 50th Anniversary 1904-1954

...a Half Century of Concrete Masonry Progress!

. BUILDS PROFITS for YOU



4 "MATERIALS-and-METHODS" SERVICE

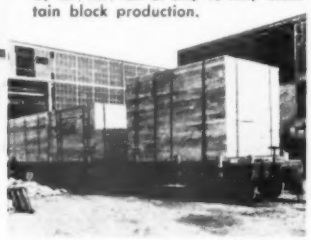
Working closely in cooperation with Portland Cement Assn., National Concrete Masonry Assn., American Society for Testing Materials and other organizations, Besser offers to block producers the cumulative results of Materials and Methods research and testing. Sieve Analyses are provided . . . plus aid to assure clean aggregate; right grading and proportioning; proper cement proportioning; right mixing time; correctly compacted concrete; steam curing for strength and uniformity of block; covered storage for drying; quality controls throughout production.

7 CO-OPERATIVE SALES PROMOTION

Many sound advertising-merchandising aids to sales are provided, including National Advertising; Newspaper Ad Mats; Home Builders Booklets; Plan Books with 180 modern home plans; Exhibit Units; Movie Films; Radio Scripts; Special Bulletins; Match Books; Post Cards and other valuable aids.

5 WORLD-WIDE SERVICING FACILITIES

Besser Service knows no geographical limits. Any call for service from any part of the world where Besser VIBRAPAC Machines are operating, gets prompt action. Stocks of parts are carried at strategic points. Qualified servicemen are ready to travel by air, car, rail or ship to help maintain block production.



Loading urgently needed parts into plane for faraway destination.

8 SCHOOL FOR BLOCK MAKERS and USERS

An actual working course for block producers is part of Besser 9-Point Service . . . to provide instruction for worker-students by actually making various types of block to highest quality standards. Competent Besser instructors cover all phases of production, sales and advertising . . . to guide plant operators to success.

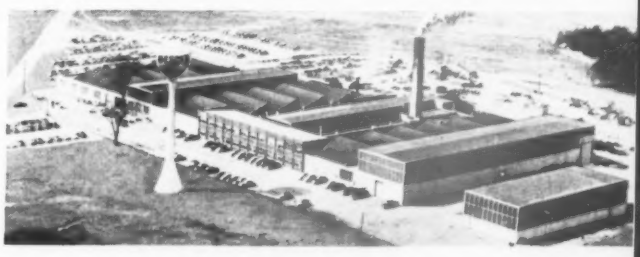
Breaking ground for Besser School near main plant in Alpena.

6 SERVICE TO ARCHITECTS and BUILDERS

Outstanding examples of Besser service to architects and builders include the development of Modular Sizes in many standard and new types of units (such as Soffit Block for floors, ceilings, roofs); permanent architectural exhibits; design and construction consulting services . . . all extending the construction range and structural versatility of concrete block.

9 SUPERIOR PRODUCTION FACILITIES

All these constructive Besser Services are predicated on Besser's unequalled facilities for maintaining highest quality standards. This big, modern plant is equipped with the finest precision machine tools. Expert mechanics, backed by half a century of engineering and production know-how, assure dependable VIBRAPAC machines and service.



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For RAPID, ACCURATE BATCHING...

THURMA-Tronic SCALES

Readily adaptable for all Batching Plants . . . OLD or NEW!

APPLICATIONS

The Thurma-tronic batching system* is adaptable for use in all concrete and asphalt batching plants. This new electronic batching system is not only available for new batch plants but also is adaptable for ALL existing plants. If you wish to increase production and reduce batching costs of your batch plant, it pays to investigate the money-saving advantages of the automatic and accurate Thurma-tronic batching system.

SPECIAL FEATURES

FOR ALL BATCHING PLANTS . . . OLD or NEW

The Thurma-tronic batching system may be used on any existing plant as well as on original installations.

UNLIMITED INGREDIENTS and FORMULAS—Because of the electronic design, any number of materials may be controlled. In addition, any number of preset formulas may be weighed by the Thurma-tronic batching system. Changes in formulas are quickly made by resetting the dials.

RAPID WEIGHING—The Thurma-tronic batching cycle is accomplished in a matter of seconds. This system may be set by the operator for one batch, continuous batching or any specific number of batches.

VERSATILE—The Thurma-tronic batching system is adaptable to either accumulative or consecutive weighing batch plants.

SERVICE—Because this is an electronic unit, based on the same principle as radio, any competent radio repairman can check tubes and make repairs in the event servicing becomes necessary.

ACCESSORIES—Strip chart recorders, one turn dials and other modifications are available for specific requirements of any batching operations.

* Patent Pending

Complete information on Thurma-tronic batching systems is available by writing for Bulletin 701. If, however, you have a specific batching problem, give us general information and our engineers will be glad to work-out the details with you.

THURMAN MACHINE COMPANY

Precision Products Since 1918

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tests, results must be taken as indications only. Oven drying and method of testing flat increased strengths considerably above those which would be obtained in ordinary block tests.

9. Block, 8 x 8 x 16 in., not reported above, made on the same machine with the same aggregate but with 40 percent of the standard cement replaced by Detroit fly ash, placed easily at standard mixing and vibration times, gave improved surface texture, freedom from core bar cracking and cohesiveness and were too strong to be broken on a 300,000-lb. machine.

Ready Mix Labor Problems

(Continued from page 137)

and every attempt to control promotions through having seniority prevail over ability. Limit time for accumulating seniority to the last date of hire. Make every effort to protect the seniority of workers who have been promoted to supervisory positions or to other jobs outside of the bargaining unit in case that either through work slow-downs or lack of ability, returns to former positions may be required.

In the ready-mixed concrete industry, with special reference to delivery employes, all new workers should be placed on probation for the first 60 days of their employment. It takes at least this length of time to properly determine the new employe's capabilities. A worker promoted to a better paying job should be given a probationary status for a period of 90 days in order to give management sufficient time to determine his fitness for the new position. Any employe returned to a lower paying position, should enjoy the same seniority in that classification as if he had not been temporarily transferred.

6. *Discharge.* Always a contentious clause in labor contracts is the one covering the right to discharge an employe upon the showing of just cause. Against the right of discharge is the duty toward an employe, who in the overall had rendered faithful service over a period of years.

Discharge is a drastic tool. The discharged employe has two strikes against him in applying for work elsewhere. If the offense charged against the employe is such that would justify dismissal, proof of guilt should be established beyond doubt. On the other hand, management should be alert in avoiding the use of discharge clauses which would specify that any discharge is subject to mutual consent of the company and union.

7. *Call-in Pay.* Ready-mixed concrete operations are on a day-to-day basis. Full bookings disappear with the coming of a downpour of rain or

other inclement weather. Call-in pay can quickly become a sizeable labor cost item. Any call-in pay clause should be subject to controls that will permit the operator to keep his costs in line. The principal consideration is: "Did the employe leave home and incur some expense due to the employer's direction that he report for work?" Limit the possibility of call-in pay to top-half seniority employes. Insist upon an understanding that, in case of bad weather, employes in the lower half of seniority shall call the office before leaving home.

Call-in pay of some type or other is present in many labor contracts of the ready-mixed concrete industry, and is generally recognized in non-union plants. The present trend in collective bargaining is from 2 to 4 hr.

8. *Wage Re-opening.* In these days of such great uncertainties, provisions for the re-opening of the wage clause, in the event of a substantial change in the cost of living, may prove beneficial to both parties. The cost of living reference should be nailed down. In the contract, the cost index to govern should be clearly stated and the effect of changes completely agreed upon.

These matters and other important items receive the careful consideration of an alert management. The conduct of labor relations is today a major concern of all employers. Those who are forced to do business with powerful, resourceful unions have a real job on their hands. The position of employers in the ready-mixed concrete industry is especially vulnerable. We have special labor problems and we deal with tough aggressive unions.

Negotiating With the Union

It is a commonly held belief that the ready-mixed concrete industry, and management in general have not consistently done a good job in labor negotiations. Too many who represent our business at the bargaining table are not qualified for the assignment. Factually speaking, they don't know the score. In the art of labor relations, they are boys facing experts. They aren't properly acquainted with the present contracts. They may not be certain how their rates, benefits and working conditions compare with other companies in the area and elsewhere in the industry. They haven't sufficient familiarity with the present cost figures nor do they have the background to fully understand the meanings of the union's new demands. They aren't able to talk facts because they don't know facts.

As a general statement, it is probably not advisable for the president of a company to negotiate the contract. It might be unwise to expose him to possible rough union negotiatory tac-

New AiroViber Moves Bulk Materials Quickly, Quietly, and Effectively...

AiroViber simple design provides dependable, trouble-free vibration

This new method of external vibration can be used to good advantage in loading, unloading, moving, packaging, processing, grading or separating bulk materials.

The AiroViber is able to deliver effective and dependable vibration with only one moving part, a heavy steel ball running on a circular track. The pounding usually associated with ordinary types of vibration has been eliminated with the special noise lessening design, exclusive with AiroViber.

Simplified Design

AiroViber's one moving part is a steel ball. An air jet blows it at high speed around a ground and hardened steel track in the housing. The weight of the ball develops a strong centrifugal force, which the vibrator transmits through its mounting into the object to be vibrated. It will start and operate under any condition and performs at high or low temperatures. AiroViber is not affected by humidity.

Trouble-Free Operation

The AiroViber is almost fool proof in operation. Because it has no close fitting parts to lubricate or adjust, it will start every time you open the air valve. You can install it in hard to get at locations with full confidence that it will operate without lubrication or maintenance for a long time.

No Installation Problems

AiroViber is easy to install. It does not need any special line oilers or air filters. Merely hook up an air hose large enough to deliver the air specified for the unit you select.

AiroViber rotary vibration breaks up arching and jamming in bins, hoppers, chutes, feeders, and other places where bulk materials hang up. It is also recommended for vibrating tables or platforms, sorting and many other applications.

AiroViber is a product of Viber Company, leader in the field of vibration. For further information, write: Viber Company, Dept. PR 71, 726 South Flower St., Burbank, Calif.

VIBER

CONCRETE VIBRATORS SINCE 1931

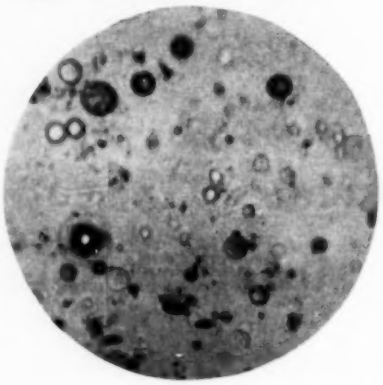
How Natural "Ball Bearings" Make *FLY ASH* Concrete More Workable

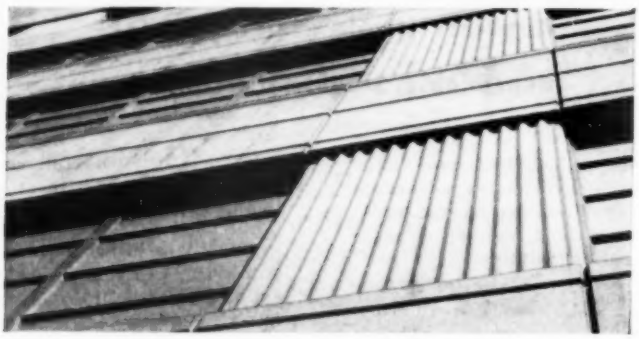
Easier to Place than Straight Cement Concrete

Yet Costs Less in Place

Today more and more concrete contractors find that Fly Ash, correctly proportioned in the mix, produces a concrete that takes much less time and labor to place than straight cement concrete.

Why? Look through the "microscope", right, at Fly Ash greatly magnified. Most of the particles are tiny, glassy spheres. When a Fly Ash mix is being poured these "ball bearings" make it flow faster and farther, without additional water. Low-slump concrete with Fly Ash is easier to vibrate into place. Watch Fly Ash concrete being placed on a job.





Fly Ash Concrete Has Sharper Detail, Smoother Surface, is Tougher, More Durable

FLY ASH *Improves*
Compressive Strength
Workability, Finish
Appearance

Increases Resistance to
Penetration by Water
Sulfuric Acid, Sulfates

Reduces
Cost of Concreting
Heat of Hydration
Harm from freezing
Harmful Expansion

The picture above, of typical architectural work, indicates sharpness of detail obtained with Fly Ash concrete. "Ball bearing" action and fineness of material make it more workable; tend to prevent voids, and to reduce bleeding, segregation and "sand streaking". These advantages have been demonstrated in the research laboratories and actual field applications.

Write for Information or Technical Help

For specific information or technical service on use of Fly Ash of proven performance, contact any of the following regarding their respective Fly Ash.

DETROIT EDISON COMPANY CHICAGO FLY ASH COMPANY
2000 Second Ave., Detroit 26, Mich. 228 N. La Salle St., Chicago 1, Ill.

G. & W. H. CORSON, INC.
Plymouth Meeting, Pennsylvania

tics. At practically all wage contract meetings, labor representatives use the jockeying position of saying to management that they will try to sell a proposal to their men. The company negotiator should also have the "out" of consulting his people.

Select the most competent negotiator who is available to represent your company at the bargaining table. Keep this in mind! An effective management negotiator has to have the necessary "know how" and must be a good "horse trader." It's up to you to give him the facts and provide him with suitable trading material.

The employer's negotiator should come to the labor contract meeting prepared to show that: (1) earnings of employes compare favorably with other workers in the area; (2) workers are getting a fair share of the sales dollar; (3) wage increases have been kept in step with the raises in the cost of living; (4) personnel program and labor contracts are clearly equal to or exceed community standards; and (5) contract concessions to be granted, and management proposals, offer a just settlement to the men and represent the most that the employer can afford and the men should expect.

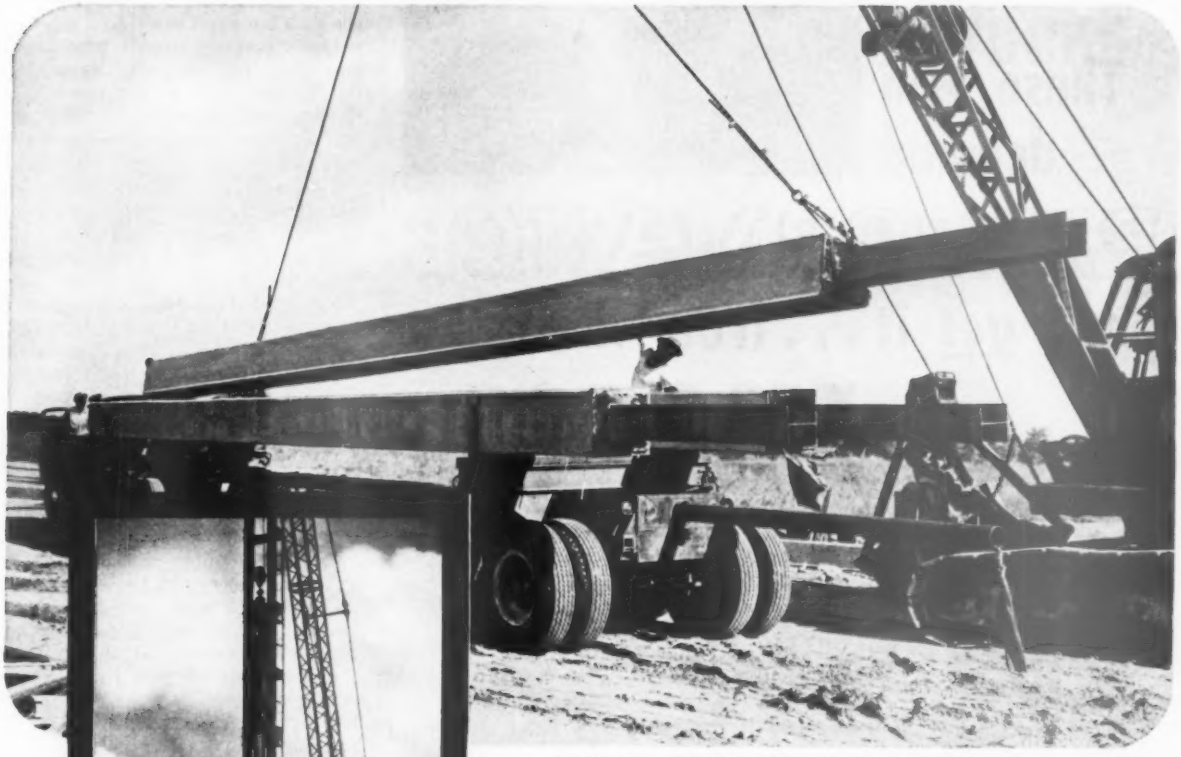
In recent years, at contract time, most of us have devoted our efforts toward one point alone; to keep the costs down. Few of us have intelligently attempted to write a better contract. In negotiating ready-mixed concrete labor contracts, always be prepared to demand some concessions for something you may have to give. For a change, be ready to show the union agent where and how the contract can be improved. See if you can get a better deal on delivery stops and slow-downs, reporting time routines, handling of the noon hour, promotion and transfer procedures, last trip delays or washout performance. Whenever you acquiesce to new demands, attempt to get something in exchange that will lead to improved operations.

All of us know how demanding the unions have been. At all times we are ready to belabor them for their aggressive tactics. Few of us care to discuss how well we have presented our position. Do we ever effectively state our side of the case? How long has it been since we've even asked for something in return or earnestly tried to eliminate some items that simply don't belong in the contracts.

It takes hard, intelligent planning on the part of management to improve an existing labor agreement. Carefully prepare your negotiation tactics. Study conditions with foremen and other key personnel. Get them to thinking and talking. Find out what's wrong with the present agreement and what's

(Continued on page 152)

NOW—PRESTRESSED CONCRETE PILES OPEN ANOTHER BIG MARKET



Loading three of the 20" x 20" composite prestressed concrete and steel test piles cast for the new Gandy Bridge by Florida Prestressed Concrete Co., Inc., Tampa, Florida.

Driving a 50-foot precast, pre-tensioned pile, designed by Lakeland Engineering Associates of Lakeland, Florida and produced by R. H. Wright & Son, Fort Lauderdale, Florida.

Handling a precast, pre-tensioned pile with one point pick-up — proving the pile's extreme strength. If a reinforced concrete pile were lifted in this manner it would buckle from its own weight.

ONE OF THE NEWEST DEVELOPMENTS in the precast, pre-tensioned concrete field is piling. Such piling has already been used for several bridges, and is now under consideration or contract for several more. Illustrated above, for instance, are composite test piles designed for the new Gandy Bridge* which will form another connection between Tampa and St. Petersburg, Florida. 30 feet long by 20 inches square, these piles have a 10-inch sonovoid hollow, and a steel H beam bottom tip extending into and beyond the end of the pile. The steel tip is sometimes added to pierce the rock strata peculiar to some areas of Florida.

The tensioning elements employed are Roebling 3/8 inch diameter, 7-wire stress-relieved Prestressed Concrete Strands, and the initial prestressing force is 151 tons.

Roebling engineers, who have led in the development of prestressing techniques and tensioning elements in America, are always ready to cooperate with you to help assure top results on any specific prestressed concrete application. Write Construction Materials Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

*Designed by the Bridge Division of the State Road Department of Florida.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

PAVISH CONCRETE WORKS
EAST ALTON, ILLINOIS

LEFT TO RIGHT: PAUL PAVISH,
L. J. PAVISH
LEO PAVISH, JR.

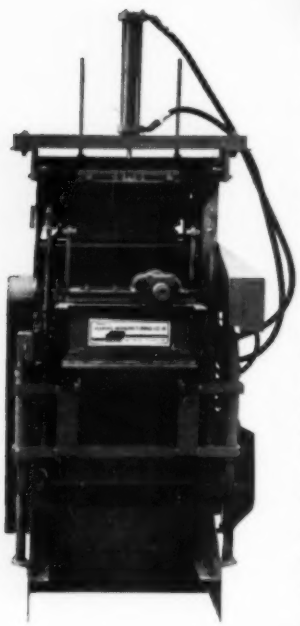
These men demand

PERFORMANCE

and *get* it . . . from their

FMC-180

FULLY AUTOMATIC CONCRETE BLOCK MACHINE



The men from Pavish wanted a machine that would give *performance* — efficient, economical, trouble-free performance, year after year. That's why they chose Fleming's FMC-180, for a smooth operation *at the touch of a button!* They wanted the 180 because it produces clean, sharp-edged blocks on plain pallets: because it eliminates the need for an extra man: because it vibrates under pressure; because of its efficient, economical hydraulic power plant. They obtained *all* these money-making features in the FMC-180 — and *you can too* — at a cost *far less* than any other comparable precision-engineered block machine on the market today!

MAIL TODAY!

FLEMING
MANUFACTURING CO.
487 FLEMING AVE.
CUBA, MO.
PHONE: CUBA 400

Gentlemen:
Please rush complete information, including specifications, prices and terms on the low-priced, fully-automatic FMC-180 concrete block machine.
Also request information on:
☐ FMC-400 Automatic Double Block Machine
☐ FMC Stationary Mixers
☐ Flem-Stone Automatic Block Splitter CP

Name_____
Firm_____
Address_____
City_____ Zone___ State_____

required for improvement. Determine on what points the present contract fails to fit your operations. Attempt to learn possible union demands. Cut through the window dressing. Get down to basic proposals. Thoroughly prepare your own agreements. Decide what you want and what you'll give to get it. When you come into a meeting properly prepared, you'll have some idea where you are going. Remember this; whatever you do, at a negotiation meeting, that somewhere in the world you are either helping or hurting management!

Laborwise, our industry is made up of many comparatively small companies. Small companies don't usually set wage patterns. In today's negotiations, about the most that one of our companies can accomplish is to effect a compromise of some pattern that others have set. If an area pattern on granting pensions has been worked out, it won't do you any good to shout, "We can't afford any such nonsense!" Your only possible out is to prove, through a careful presentation of facts and figures, your inability to pay. Of course, the union will demand something else in trade.

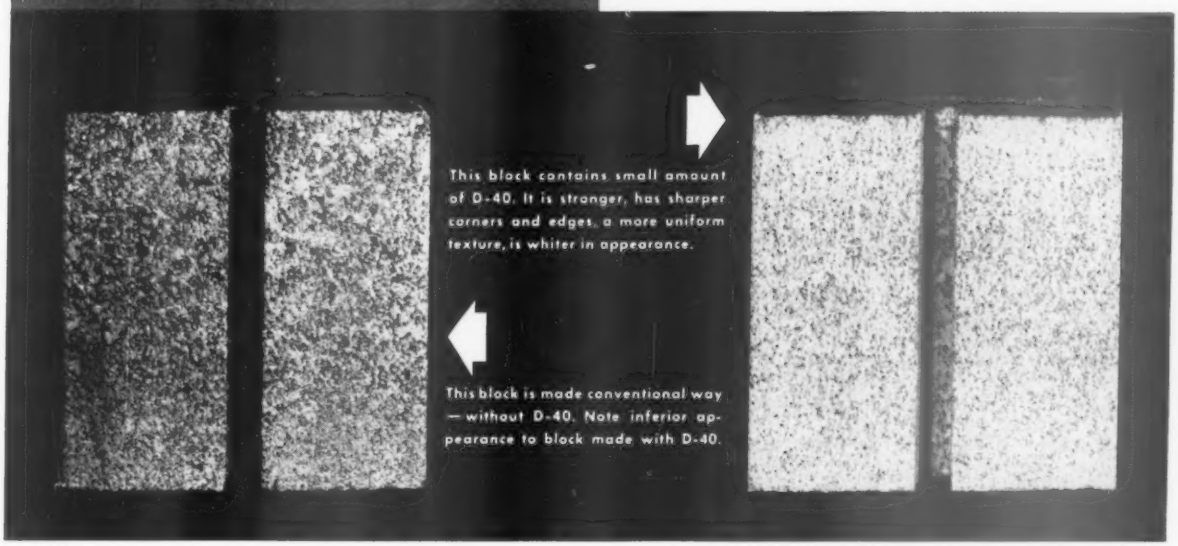
Our labor future is being decided by big business. Make no mistake about that! In sales efforts, you don't always have to do business with the big fellows. You can "spread your eggs around." In labor relations, it's only big business. Alone, you never get a chance to take on somebody of your size. When labor sits down with big business to set a wage pattern, all the chairs at the bargaining table are occupied by big business. Later on, big business, in the form of the national labor organization, tells their local people the deal that they want in any particular city, with your company and mine.

Today, at many bargaining tables, what the employer can afford, what's fair to the workers, what the industry standards are, what plant conditions need improving and other basic matters may not even be discussed by the union leaders. Instead, it's ". . . the men want this — we are going to get this — this is what we've got to get — it's either this or stand a strike . . ." and the like. In the face of such farcical negotiations, management almost unconcernedly does nothing. Well, what have *you* done about it?

Most in our industry no longer face the question of how to avoid having a union plant. The present problems may not even primarily concern wage increases or improved working conditions. Today, in the labor package that's handed to us, there may be little that's particularly good for our own men. Labor problems in our own op-

BETTER concrete blocks at lower operating costs

with low-cost D-40


This block contains small amount of D-40. It is stronger, has sharper corners and edges, a more uniform texture, is whiter in appearance.
This block is made conventional way — without D-40. Note inferior appearance to block made with D-40.

Reduced abrasive wear on mixing and molding equipment
Mixes pour into molds faster, "break" cleaner—saves time
Closer bonding—saves on painting and waterproofing

Let us show you how we have helped other concrete product manufacturers make superior blocks and at the same time reduce their operating costs.

Oronite's ready-to-use additive, D-40, is economical and easy to use. Only one to two ounces is needed per bag of cement. Just add to dry cement at the mixer.

For complete information, sample and technical help, write or call the Oronite office nearest you.

ORONITE CHEMICAL COMPANY

200 Bush St., San Francisco 20, Calif. • 714 W. Olympic Blvd., Los Angeles 15, Calif.
30 Rockefeller Plaza, New York 20, N. Y. • 20 North Wacker Drive, Chicago 6, Ill.
Mercantile Securities Building, Dallas 1, Texas

ORONITE CHEMICAL COMPANY

2899

Completely AUTOMATIC

Entirely SATISFACTORY

KENT CONTINUOUS MIXERS

Completely automatic operation with continuous delivery of uniform, high quality mix are responsible for the constantly growing popularity of KENT Continuous Mixers.

A batch mixer requires at least one man to charge the mixer and operate the controls.

With the Kent Continuous Mixer the man Sets the machine—STARTS it and LEAVES it to work elsewhere. *Labor cost savings are definite and sizeable* aiding in meeting competition.

Kent Continuous Mixers require less power with *definite savings in current cost.* And they require less maintenance which *effects further savings.*

For top efficiency in operation a Kent Continuous Mixer *is a must.* Its advantages are available to all—from the relatively small producer to the man who operates the very largest block machines.

Write TODAY for information regarding the complete line.

The KENT MACHINE COMPANY

CUYAHOGA FALLS, OHIO

CONCRETE PRODUCTS MACHINERY SINCE 1925

Canadian Distributor: Wettlaufer Equipment, Ltd., 49 Merton St., Toronto 12, Ontario

COLOR MAKES THE SPLIT BLOCK

USE: PURE—STRONG—CLEAN COLORS

11 REDS—from peach to burgundy
5 YELLOWS—from lemon to buff
15 BROWNS—from beige to chocolate

PLUS

BLACK — GRAYS — BLUES — ORANGE

AND

TWO DISTINCT TYPES OF GREEN

Distribution Points Throughout the Country

FRANK D. DAVIS COMPANY 2704 Santa Fe Avenue Los Angeles 58, California

Labor Problems

(Continued from page 152)

erations probably have been given scant attention.The package is apt to be a pattern deal that the local union boys have been told by their bosses to either get or take our employes out on strike. Such high-handed actions are neither collective nor bargaining.

In Toledo, contracts with the Teamsters and Operating Engineers are negotiated by a committee representing the building supply industry. Although we are solely in the ready-mixed concrete business, these annual labor agreements are binding upon us. This is not a satisfactory arrangement. Operating conditions, pertinent to our own company, are given no real consideration. Year after year, the difficulty of working under a labor contract that is not tailored to our operations leads occasionally to unnecessary misunderstandings.

The long continued success of the unions, in regularly getting important, sizable concessions, has affected all employes and union leaders. Most workers now believe that a demand squeeze is a necessary annual pattern. Employes have seemingly lost all fear that the well will ever run dry.

Because of the important part that transportation plays in the ready-mixed concrete business, our prime concern in labor relations is with the Teamsters Union.

The Teamster's Union, under Dave Beck and James Hoffa, is aggressive, powerful and tough. Their members are dedicated to a nationwide organization drive. Their declared objective is to make their union the most powerful single organization in the A.F. of L. Beck and Hoffa, together with other close associates, have the "know how" to accomplish this objective. The great growth of the trucking (over-the-road haulers) industry, under the benevolent protection of state P.U.C. and Federal I.C.C. trucking permits, offers Teamsters representatives a very fertile field for getting just about what they want in wage increases and added benefits. At contract time, you will be told about what the truckers gave and the wage package that you're handed may be largely based on the concessions that the union has already received from the trucking industry. It will take the best brains, and the closest cooperation that the ready-mixed concrete industry can muster, to effect equitable settlements in annual wage negotiations with this militant union.

In its negotiations with the Teamsters, management cannot afford to be divided. There must be a united front. It is fundamental that you can't stand

(Continued on page 156)

PROPER WEIGHT DISTRIBUTION

...So you can haul
MORE LEGAL PAY LOAD on SHORTER WHEELBASE TRUCKS
with 5½-cu. yd. and 6½-cu. yd.

BLAW-KNOX *Hi-Boy* TRUKMIXERS

NOW you can really put the profit show on the road! With the newly designed Hi-Boy Trukmixer you can *legally* haul a half yard more than the normal rated capacity. That extra pay load is the result of proper weight distribution.

By moving the mixer weight forward 20 inches, you utilize more of the legal weight allowance on the front axle. You can get the show on the road quicker, too, because the big inner cone and the design of the blades permits faster charging and discharging.

It's impossible to list here the many practical, profitable features of these new Hi-Boys. Ask your Blaw-Knox distributor to give you the complete story.

BLAW-KNOX COMPANY
BLAW-KNOX EQUIPMENT DIVISION
PITTSBURGH 38, PA.
Offices in Principal Cities

See Your BLAW-KNOX DISTRIBUTOR Today

ASK ABOUT THE *"Complete Ready-Mix Package"*

PEDESTAL AND FLUSH WATER TANK COMBINED to reduce weight approximately 1000 lbs. and substantially lower the center of gravity of the loaded mixer.

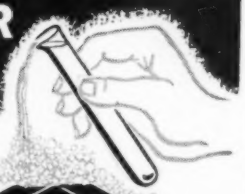
TRANSMISSION LOCATED AT SIDE of pedestal-tank combination reduces cab-to-rear-axle dimensions by 20" and permits easy access even with close clearance between mixer and cab. A single lever controls drum rotation through oil-type multiple disc clutches.

ENGINE LOCATED AT LEFT REAR assures maintenance convenience and easy access to vital parts for periodic attention. Inexpensive, easily cleaned air filter protects radiator. Engine fully visible to driver when backing.

BEST WATER MEASURING SYSTEM AVAILABLE. Measures by meter (set for any quantity to 1/10 gallon.) Measured volume accurate to ½ of 1%. Shuts off automatically when the required quantity is reached.

LARGE DIAMETER SHORT DRUM mixes even zero slump concrete fast and thoroughly. Guaranteed to mix ½-cu. yd. over the normal rating to the most exacting specifications. Special design of drum opening enables the 5½-cu. yd. Hi-Boy to carry 7 cu. yds., and the 6½-cu. yd. Hi-Boy to carry 8¼ cu. yds. of 6" slump concrete on a 10% grade without spillage.

Get FREE PROOF of
BETTER CONCRETE
LOWER
COST



with . . .

AD-AIRE

Meets A.S.T.M. Specifications

AIR ENTRAINING AGENT

SEND for FREE
1 GALLON TRIAL

THE AD-AIRE FORMULA blends air bubbles evenly through the mix. It's an approved method of boosting quality while cutting costs. Only about 1 oz. per sack of cement is needed.

READY-MIX PLANTS report lower material costs and greater ease in handling. AD-AIRE increases flowability for faster unloading. Because of increased workability and plasticity, customers can handle the concrete faster...there is less bleeding, less segregation and fewer requests for added water. Mixers are easier to clean. It's a concrete that stands up to freezing and thawing and better resists scaling, spalling and cracking.

CONCRETE PRODUCTS PLANTS have found AD-AIRE air entrainment gives sharper corners and cleaner edges. There is less mixing time, smoother machine operation and faster production. The improved textures and finer finishes obtained with AD-AIRE provide products with a higher quality appearance. Machine-made products are uniform despite variations in moisture content and aggregate gradation. With AD-AIRE you'll also find a reduction in culls, stripping damage and green handling.

Prove It To Yourself. Send For FREE TRIAL SAMPLE. No Obligation.

Carter-Waters Corp.
Dept. P-3 2440 Pennway
Kansas City 8, Missouri

Gentlemen: At no obligation to me, please send free gallon can of AD-AIRE with complete information.

Name _____

Firm _____

Address _____

City _____ Zone _____ State _____

alone. A force, capable of resisting unreasonable demands of a powerful union, must be developed. It is doubtful that ready-mixed concrete people, by themselves, can form a sufficiently strong group. It probably will be necessary to coordinate some efforts with other employers who have contracts with the same union — building supply and lumber dealers, local dump-truck operators, aggregate producers, coal men, etc. These concerns and others are undoubtedly being given the same squeeze.

The developing pattern of the Teamster's union indicates that the above listed management groups may have to consider cooperative effort on a statewide basis. Each state, or area, ready-mixed concrete association should have an active, alert labor committee continually studying union demand patterns and aggressively considering contemplated future actions. Working arrangements should be developed with other area employer associations. Realism must be faced. You simply cannot resist nationally organized, aggressive union tactics and demands with poorly conceived, half-hearted local efforts.

When the time comes that a powerful, headstrong union no longer recognizes facts and reasoning in labor negotiations, strong united resistance may be the only adequate means of survival. Industry leaders should consider all cooperative means, legally available, to effectively present their cause.

As negotiations develop, union representatives try to determine how far they can go. If consistently, over the years, they have been getting by with the threat of a strike to quickly get employer consent to tough demands, eventually you may have to face a strike in order to keep demands within reasonable bounds.

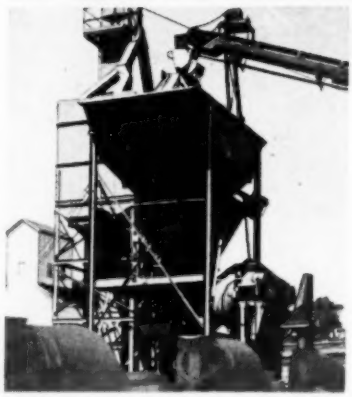
Management's inherent fear of a strike has repeatedly been worked to the union's advantage. Employers generally overlook the fact that many workers, and practically all employe's wives, also wish to avoid strikes. Until management is willing to present a united front to the threat of a strike, the strike weapon will continue to upset facts, figures and reasoning at the bargain table.

Labor trouble in the ready-mixed concrete industry will level off when producers give as much attention to labor problem as they do to sales efforts.

•

SPANGLER READY-MIX, INC., was recently established at Kings Mountain, N. C., by Ernest, Pat and Bud Spangler, who also own and operate a ready-mixed concrete plant at Shelby, N. C.

COMPLETE PLANTS
from a Single Source



- "Tilt-Up" Mixers
- Ready-Mix Plants
- Expressway Semi-Portable Plants
- Dry Batch Plants
- Cement Bins
- Aggregate Bins
- Cement Storage

ENGINEERED TO WORK TOGETHER

From conveyor to elevator, from bin to mixer Burmeister equipment is designed and built by the same organization. Because each product is *"engineered to work together"* you are assured less costly "conversions," maximum production speed, accurate delivery of materials, and greater economy of operation. See your nearest Burmeister Distributor or write for details.

FREE CATALOG

Send for new 16-page illustrated Catalog of Burmeister Plants and Equipment.

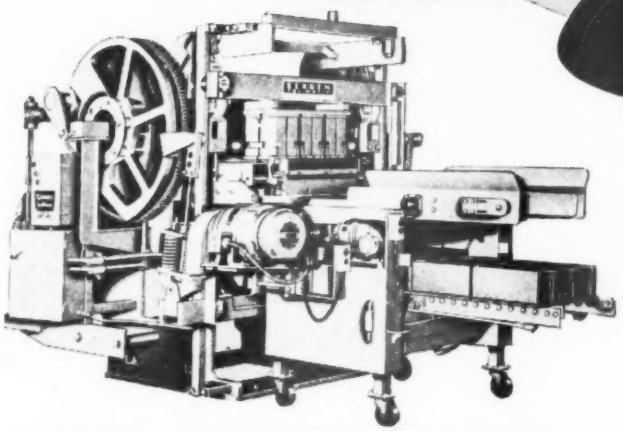
COMPLETE PLANTS FROM A SINGLE SOURCE

Burmeister

L. BURMEISTER CO., 4535 W. MITCHELL ST., MILWAUKEE 14, WISCONSIN

MODERN EQUIPMENT FOR MODERN PRODUCTION

GET IT AT BERGEN



HIGH-PRODUCTION TRI-MATIC
(1000-8" BLOCK PER HOUR)

AVAILABLE 3 WAYS

1. CASH PURCHASE
2. TIME PAYMENTS
3. LEASE WITH OPTION TO BUY

More and more block plant owners are realizing the importance of good, modern, dependable equipment. Many of these owners also realize the importance of the manufacturer from whom they buy their equipment.

When dealing with Bergen, block plant men have found the Bergen organization to be reliable and dependable — an organization with over 30 years experience and "know-how" in the block business — an organization that stands behind every product it sells or service it renders.

WOULD YOU LIKE A BERGEN SALESMAN TO SHOW YOU THE COMPLETE BERGEN LINE OF BLOCK PLANT EQUIPMENT AND TALK OVER YOUR PROBLEMS? YOU'LL FIND HIM HELPFUL AND THERE'S NO OBLIGATION ON YOUR PART.

HEADQUARTERS FOR BLOCK PLANT EQUIPMENT

50 Cu. Ft. MIXER • SKIP-HOIST • FRONT PALLET RETURN • HEIGHT AND DENSITY CONTROL • PALLET CLEANER • REPLACEMENT PARTS • YARD-BIRD SWEEPER • FORNEY TESTERS • BLOCK SPLITTER • LIGHT WEIGHT OFF-BEARER • TIME RECORDER • SPECIALIZED TOOLS

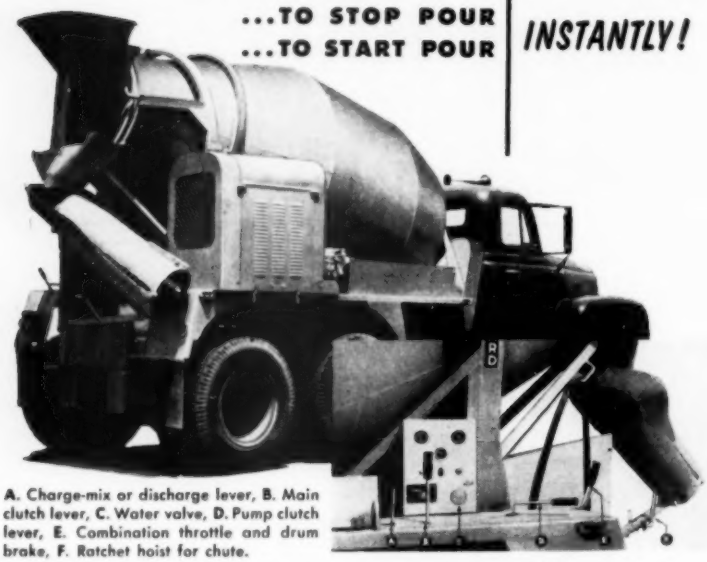
Let Bergen estimate on your next replacement part, repair or new equipment. Simply call Bergen "Collect" or write to:

BERGEN MACHINE & TOOL CO., INC. NUTLEY, N. J.
You are invited to call us "COLLECT". NUTLEY 2-7300

IN CANADA
Construction Equipment Co., Ltd.
Toronto
Halifax, Montreal, London, Edmonton

5 and 6 C.Y. WILLARDS have *Positive Control*

...TO STOP POUR
...TO START POUR *INSTANTLY!*



A. Charge-mix or discharge lever, B. Main clutch lever, C. Water valve, D. Pump clutch lever, E. Combination throttle and drum brake, F. Ratchet hoist for chute.

...Controls are Centralized

THERE IS LESS SPILLAGE, less trouble placing concrete with a big 5-6 c.y. Willard because the controls are centralized at the rear and because a Willard has a combination throttle and drum brake. You can stop or start the pour in an instant—no spilling, it can pour a cupful or a full load.

Note how main clutch, pump clutch, water valve and drum controls are conveniently located. Here is the truck mixer with the balance for extra large payloads. Drum drive is by Chrysler 6-engine with fluid drive. Has low center of gravity... short wheelbase mounting... and many exclusive features.

See it at your Willard dealer's or write for bulletin.

Manufactured in Los Angeles, California and Galion, Ohio

WILLARD CONCRETE MACHINERY SALES CO., 11700 Wright Road, Lynwood (Los Angeles County), Calif.

WILLARD TRUCK MIXERS

MAKE MORE MONEY MAKING

THE LARSEN "LIFETIME" FENCE POST

Add this profit-making item to your present line. It makes a perfect fill-in for odd times—and can readily be developed into a major production unit. You can start with a few molds and add more as your business grows.

Write for ***FREE*** *Bulletin R54.*

CONCRETE POST FORM COMPANY
Box 368 Cedar Falls, Iowa

KEEP ABREAST WITH INDUSTRY TRENDS THROUGH ROCK PRODUCTS

Washington Products Meeting

THE CONCRETE PRODUCTS ASSOCIATION of Washington held its annual Fall meeting at the Hotel Chinook, Yakima, Wash., September 24 and 25. This association, which covers both the concrete block and pipe groups, has a membership of 27 companies, five of which are also members of N.C.M.A. The Yakima meeting was well attended by producer members, and by those with parallel interests; such as cement, lightweight aggregate (natural and manufactured), and equipment salesmen.

Directors' meetings were held on the first day. The morning session of the following day was a general business meeting during which finances, directors', and committee reports were heard. The meeting was under the chairmanship of W. S. Wilson, president of the Concrete Products Association of Washington, with W. S. Callander, engineer-secretary acting as co-chairman. Much of the discussion revolved about proposed changes in dues and the necessity of smaller regional groups helping the association promote sales in a particular area. Clay manufacturers appear to be quite active. It was suggested that the cost of a regional sales effort be borne by the company getting the job.

In the afternoon, the groups split up into block and concrete pipe sections with J. W. Sullivan heading the block group, and A. B. Metcalf, the pipe manufacturers. Later, the two groups assembled and made practically parallel reports with the general theme built around the need for more study of ways and means to promote sales. As the amount of money available for advertising was relatively small, it was felt that more study should be given to the best way to spend that money.

Direct mail, radio, TV, newspaper space, and similar approaches to the problem were discussed. It was decided to hire an assistant to Mr. Callander to be stationed at the Seattle office so that Mr. Callander could spend more time in the field, contacting buyers of all types, with emphasis on group buyers — architects, contractors, construction, etc.

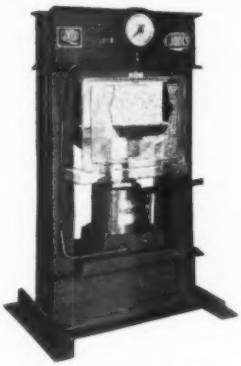
Luncheon for the convention delegates and guests was held at the Yakima Country Club with arrangements provided by Ellis Cummings of Yakima Cement Products Co.; the ladies were entertained at a luncheon at the Four Winds restaurant with arrangements in charge of Mrs. W. P. Hews. A cocktail hour, sponsored by the Yakima Cement Products Co., preceded the banquet. The principal speaker at the banquet was Leight Loder, personnel manager, General Electric Co., Richland, Wash., whose sub-

ject was, "The Power of Words," which was in keeping with the theme of the meeting on "how to sell." Richland is one of the nation's important atomic energy centers. Dick Hews, Yakima, Cement Products Co., acted as master of ceremonies at the banquet in the evening.

Concrete Roof Deck Manual

GREAT LAKES CARBON CORP., Perlite Div., has published the "Permalite Concrete Roof Deck Specification Manual," a 218-page handbook on lightweight, insulating, fireproof concrete for roof deck construction. It is divided into two sections: Structural Roof Decks; and Non-Structural Insulation Fill. Six basic types of roof structural forms are covered, with tables specifying the slab thickness required with different Permalite concrete mix ratios, the strengths and the *K* or *U* factors for the entire roof-ceiling combination. The tables are based on different joist spacings, and six different types of ceilings for the basic forms. Drawings point out construction details, and typical mix designs, technical data on sub-purlins, and insulation data are given. The manual is available to architects and engineers, free of charge, from Great Lakes Carbon Corp., Perlite Div., 612 S. Flower St., Los Angeles 17, Calif.

Jones **COMPRESSION TESTING MACHINE**



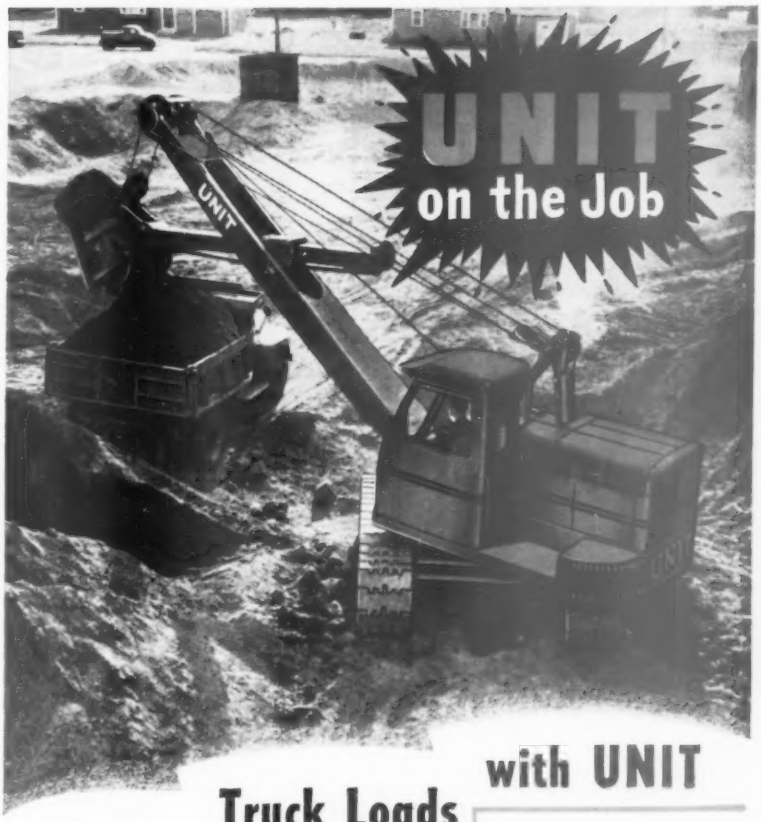
for more economical mixes, and uniformly higher strength

By doing your own testing of concrete blocks and cylinders, you will immediately discover anything which may have gone wrong with the aggregate, grading, mixing, etc. This will help you maintain more uniform quality and develop more economical mixes. The Jones (formerly Yoder) testing machine is low in first cost, specially designed for concrete products plants.

Send for list of satisfied users and literature.

J. A. Jones **CONCRETE MACHINERY**

108 Horning Road, Pittsburgh 34, Pennsylvania



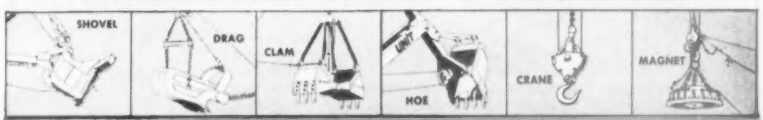
Step-up Truck Loads with UNIT

Here's a UNIT ¾ yard Shovel that's "in there swinging" . . . making big payloads. UNIT'S balanced stability and power permit hard digging . . . produce maximum yardage at low operating cost. Fewer working parts cut down replacements required . . . reduce maintenance costs. The FULL VISION CAB enables operator to see in ALL directions . . . promotes safety . . . increases efficiency. Results in more loads per day and easier load handling. Get the complete UNIT story. Write for literature.

UNIT CRANE & SHOVEL CORPORATION

6431 WEST BURNHAM STREET • MILWAUKEE 14, WISCONSIN, U. S. A.

½ or ¾ YARD EXCAVATORS...CRANES UP TO 20 TONS CAPACITY
CRAWLER OR MOBILE MODELS . . . GASOLINE OR DIESEL



All Models Convertible to ALL Attachments!

A 7312-⅔-PC

Front view showing operator feeding block into BES-STONE Block Splitter.

Make this your BEST year with the BES-STONE Block Splitter

Expand Your Opportunities — Cash in on the Split Block demand. Its "quarried stone" character pleases owners. You'll find it ideal for all structures, large or small . . . commercial, institutional or home construction. BES-STONE challenges the creative ability of both architects and builders.

Splitters in 18" and 24" sizes — Automatic, powerful, hydraulic operation . . . up to 960 Split Block per hour. Straight line cuts . . . No cull block. Easily adjustable for splitting various block heights. Block is placed under knife, automatically. And the finished Split Block is automatically removed from under the splitting knife by the incoming block. Quiet, safe operation.

Fast, Accurate

Profitable Producer of 960 Split Block per Hour!

There's big money for you in attractive, permanently colorful BES-STONE Split Block. It complements and increases sales of standard stripper block. Get all the facts. Write for BES-STONE Bulletins 95A and 100.

BESSER 50th Anniversary 1904-1954

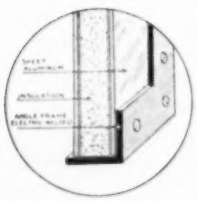
Note the natural beauty of BES-STONE. No maintenance, no painting, no peeling off.

BES-STONE *the Split Block with Character*

BESSER MFG. CO. • Complete Equipment for Concrete Products Plants • Alpena, Michigan, U.S.A.

Moore Carrier-Type Doors at Glynn Concrete Co., Brunswick, Ga.

Moore Metal-Insulated Kiln Doors Save Fuel—Reduce Curing Time



Keep heat where it belongs—inside the kiln—with Moore Aluminum-Insulated Doors. They improve curing conditions — save steam—last longer.

Send us dimensions of present door openings for quotation.

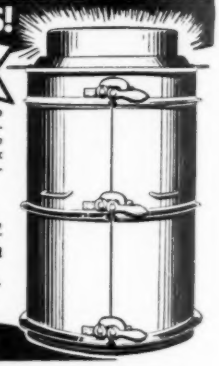
MOORE DRY KILN COMPANY

Oldest and Largest Manufacturers of Lumber and Veneer Dryers

JACKSONVILLE, FLORIDA · BRAMPTON, ONT. CANADA · VANCOUVER, B.C. CANADA · NORTH PORTLAND, OREGON

FOR THE FINEST CONCRETE PIPE... YOU NEED FINEST FORMS!

THE *Quinn Standard*



Backed by over 40 years of reliable service, the QUINN STANDARD is recognized as the finest concrete pipe form the world over. Thousands of pipe manufacturers, from the smallest to the largest, look to Quinn for equipment to produce the finest concrete pipe at the lowest possible costs.

• QUINN HEAVY DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry process. Sizes for pipe from 10" to 120" and larger. Tongue and groove or bell end pipe in any length desired.

WRITE TODAY for complete information and estimates.

Also manufacturers of QUINN CONCRETE PIPE MACHINES

Quinn WIRE & IRON WORKS BOONE, IOWA

NOW MORE THAN 140 *LICENSED MANUFACTURERS Producing*

Patented

homeward *Concrete* **STEPS**

A Small Investment That Pays Big Dividends

Homeward all metal forms are precision built to produce a product that requires no hand finishing.

The exclusive franchise for your territory may still be open.

For Complete Information Write

ROGER F. WILLIAMS, Licensor

3420 S. W. 9th St. Des Moines (15), Ia.

New Ready-Mix Association

THE MISSOURI READY MIXED CONCRETE ASSOCIATION recently held an organizational meeting at Columbia, Mo., with 11 ready-mixed concrete producers in attendance. The association is a development of a group of ready-mixed concrete producers in the northern part of the state who had been meeting every six months for the past two years. Their meetings were said to be so productive in solving mutual problems and generating a spirit of cooperation that it was decided to organize formally. Lon C. Ware, president, stated that the association's first endeavor would be to contact all the ready-mixed concrete producers in the state to obtain as many members for the first annual meeting as possible.

Service Manager

HAROLD B. NILES has been appointed service manager of Lith-I-Bar Co., Holland, Mich. He will be in charge

Harold B. Niles

of activities of the field service men throughout the country. Prior to his new assignment, Mr. Niles spent five years on the road, servicing the Lith-I-Block machine manufactured by the company.

Prestressed Concrete Book

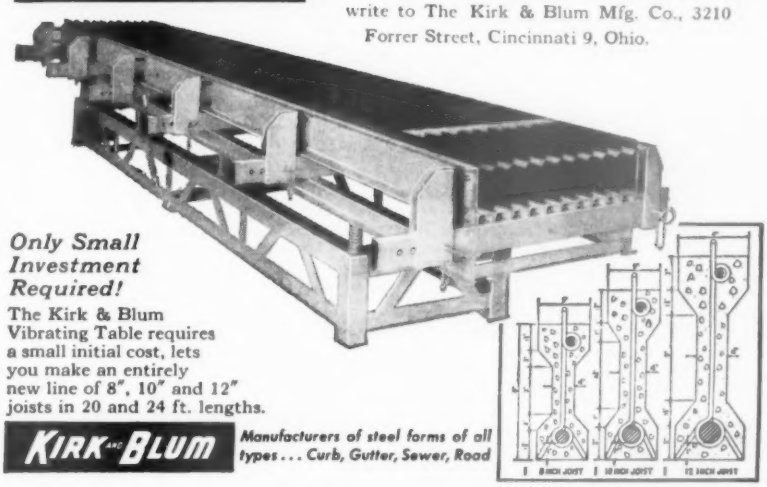
THE AMERICAN CONCRETE INSTITUTE has announced publication of an 86-page book entitled "Bibliography on Prestressed Concrete." It lists 2000 American and foreign literature references on the subject of prestressed concrete, published from 1896 through 1953, and a separate section lists approximately 60 United States, British, German and French patents. It is available at a cost of $2 from the American Concrete Institute, 18263 W. McNichols Rd., Detroit 19, Michigan.

Add a New Profit-Maker

Increase Your Volume

PRODUCE CONCRETE JOISTS, LINTELS AND FENCE POSTS with the KIRK & BLUM HEAVY DUTY VIBRATING TABLE . . .

Your experience in the building trade should make it easy to build up a profitable business in this new line. The products are simple to make, have unusual strength, are termite proof. The KIRK & BLUM Type "S" Heavy Duty Vibrating Table is capable of multi-production of concrete joists, allowing a fine profit-margin. Easily produced by unskilled operators. For complete details and prices, write to The Kirk & Blum Mfg. Co., 3210 Forrer Street, Cincinnati 9, Ohio.



Only Small Investment Required!

The Kirk & Blum Vibrating Table requires a small initial cost, lets you make an entirely new line of 8", 10" and 12" joists in 20 and 24 ft. lengths.

KIRK and BLUM

Manufacturers of steel forms of all types . . . Curb, Gutter, Sewer, Road

watch for the new!

Pacemaker

truck mixer

LT-500

QC-200

QC-125

QC-100

FORNEY

Serves the Entire Industry with a Compression Tester for Every Purpose . . . Cubes . . . Cylinders . . . Blocks . . . Beams . . . Lintels . . . Brick . . . Pipe up to Seventy-two Inches Diameter.

They tell what your products test at any time you want to know, and let your customers and prospects

SEE FOR THEMSELVES

WRITE FOR BULLETIN 504

FORNEY'S, INC.

215 ELM ST. • NEW CASTLE, PA.

Make Money Manufacturing CEMENT DRAIN TILE

Today's tremendous demand for drain tile opens up a choice field for the wide-awake concrete products manufacturer. Either as a business by itself or as a profitable addition to the regular line.

The Champion machine makes all sizes of tile up to 12-inch diameter. With such a range you can supply not only the huge farm market, but many others where drain tile is urgently needed —reclamation projects, home building, road construction, subdivision activities, etc.

CHAMPION DRAIN TILE MACHINE

Tile made on the Champion are outstanding in quality—dense, strong, uniform. Far better than clay tile, yet can sell for less—even after allowing a handsome profit on manufacturing operations. The Champion machine is simple, compact, easy to operate.

Get the facts. Write for interesting literature about the business and the moderate priced equipment. A real opportunity.

CONCRETE EQUIPMENT COMPANY

562 Ottawa Avenue • Holland, Michigan

CANADA: Dunn Masonry Machinery, Ltd.
978 Dundas H'way, Cooksville, Ont.

T-2

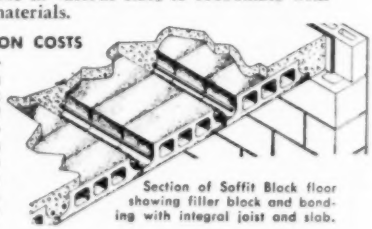
"I Find BOTH Profitable"

VIBRAPAC Block and SOFFIT Floor and Roof Filler Block

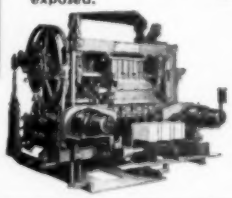
Vibrapac block plants are now adding to their profits by manufacturing Soffit Filler Block for floors and roofs. These units assure permanent, fire-safe construction, at low cost. Soffit Block provide maximum acoustical and insulation values with natural base for radiant heat installations. Made in various sizes to coordinate with other modular materials.

CUTS CONSTRUCTION COSTS

Temporary adjustable steel centers support Filler Block while slab and joist are curing. Conventional shoring is eliminated. The smooth, flush surface can be plastered, painted or left exposed.



Section of Soffit Block floor showing filler block and bonding with integral joist and slab.



BESSER VIBRAPAC

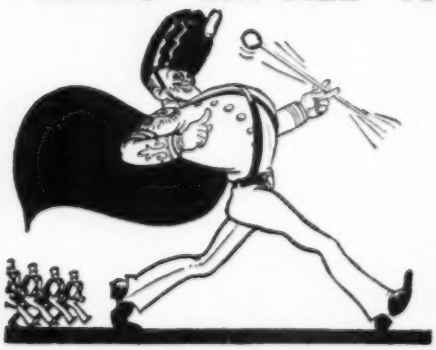
Vibrapac Block for walls, floors and roofs, in all styles and sizes, are made on a Besser Vibrapac, using one set of Plain Pallets. Fully automatic. No machine operator required. Write for descriptive literature.

BESSER MANUFACTURING CO.

ALPENA, MICHIGAN, U. S. A.

Complete Equipment for Concrete Products Plants

"LEADS 'EM ALL" for Boosting Block Plant Performance



OSWALT SERVICE for Vibrapac Owners increases block output without sacrifice of quality . . . reduces culls and green cracking to minimum . . . insures uniform height and density of units . . . lowers operating costs.

Complete **OSWALT** Service includes:

1. Improved Vibration and Machine Changes
2. Simplified Height and Density Control
3. Shock-Free Block Ejector and Front-End Pallet Feeder

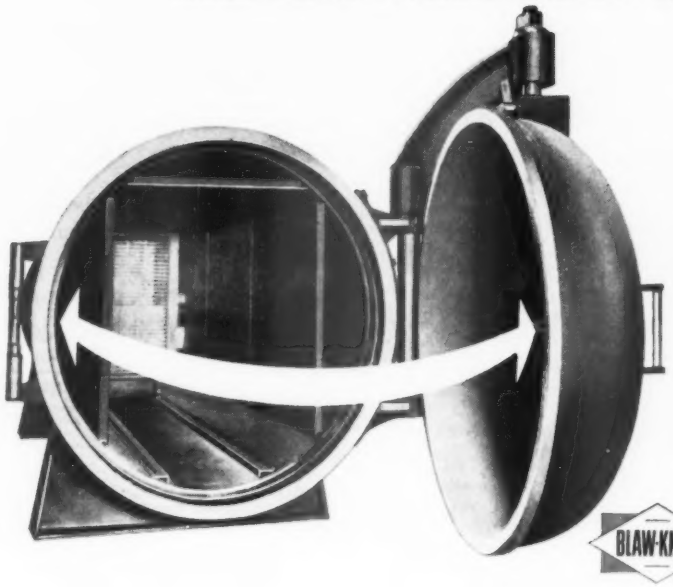
Two U.S. Patents have been allowed on Oswalt improvements; one on Synchronized Vibration, and the other on the Lug Link used in speed-up

Write for OSWALT Booklet for complete information.

OSWALT ENGINEERING SERVICE CORP.

1335 Circle Ave., Forest Park, Ill. **Phones: EStebrook 8-3666, FOrest 6-3898**

cut this cycle to seconds with Blaw-Knox Quick Opening Doors



Whether operated manually or mechanically, Blaw-Knox Quick Opening Doors are locked, unlocked, opened, or closed in a matter of seconds. They reduce the time spent on operations incidental to your process cycle.

A rim-locking mechanism fastens the doors securely into place without lugs, bolts, levers or bars. Easily replaced, self-sealing gaskets are operated by internal pressure.

If yours is a closure problem, specify Blaw-Knox Quick Opening Doors. They can be adapted to horizontal or vertical vessels.

Write for Quick Opening Door Bulletin 2435.

BLAW-KNOX COMPANY

Blaw-Knox Equipment Division
Process Equipment Department
Pittsburgh 38, Pennsylvania

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PERMANENT RUST PROOF THREADED SOCKET

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WHERE TO BUY

FOR SALE

Complete Equipment for small block plant including:

Kent Vibra Tamp Machine.
Kent Continuous Mixer water control & regulator.
Kent Elevator.
Steel aggregate hopper holds one day's production.
8" Mold box complete with base and vibrator.
12" Mold box complete with base and vibrator.
20 New steel racks 64 cap never used.
20 Used steel racks 48 cap.
2 Hand lift rack trucks.
1 Pallet dunker.
Attachments for Sash Corner Bull Nose and Half block.
Approximately 1800 steel pallets.
1 Scotch Marine 25 horse boiler with piping and steam regulator.
The above equipment is in excellent condition and complete. Nothing more is needed to produce first class block from any aggregate.

$4,500.00 F.O.B. our yard.

Union Builders Supply & Fuel Co.
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CLEVELAND 5, OHIO

One Stearns 28 Cubic Foot Mixer with Ni-hard blades mounted on steel base — 20 Horse Power motor attached to base, with all Starter and Reset Switches complete.

One Stearns 28 Cubic Foot Skip Hoist vertical track with three Horse Power motor, complete with Reset switches and Starter.

One Chute—capacity about 70 Cubic Feet.

All above equipment reconditioned, same as new. Will be sold together only.

Price $3,000.00

SLATON CONCRETE PRODUCTS
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FOR SALE

Two 4½ TRUCK MIXERS

These mixers are SMITH'S standard, operating daily mounted on International tandem trucks.

Will sell very reasonable being forced to go to larger mixers.

Yorktown Ice & Storage Corp.
Yorktown, Va.

A GOOD BUY...
COMPLETE BLOCK PLANT EQUIPMENT

1 George Machine # 400 (automatic) with off-bearer, Compressor, automatic pallet feeder, pallet tank, etc., complete.
2 George Machines # 100 complete.
2 Conveyors.
2 Mixers.
1 Car Unloader.
1 Tractor with Bucket Loader.
1 Hyster Fork Lift.
1 Truckman lift truck.
1 Pallet Hand Truck.
1 Masonry Saw and Tools
110 Steel Racks.
7500 Alum. Pallets.

Note: Most of this equipment is less than 4 years old. All in good condition—in daily use.

TOTAL price $29,250 Located in Florida
BOX M-65, CONCRETE PRODUCTS,
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PLAIN STEEL PALLETS

Furnished from prime domestic open hearth mild steel plate.

Guaranteed Quality
Flat • Square • Accurate
any size or thickness

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HIGH PRESSURE CURING SYSTEMS

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No. 9 Joltcrete equipment Pallets 45% void, 4" code Zorilla, 8" code Damper, 12" code Hearty. 4, 8 and 12" mold boxes. Air offbearer, spare motors, 110 racks.

APPLEY THREE AT A TIME BLOCK MACHINE with curved cesspool mold box and 4" solid mold box, racks, pallets and air off-bearer.

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SMITHTOWN, L. I., N. Y.

COLORS *For Cement and Concrete*

COLOR YOUR CONCRETE WITH LANSCO CEMENT COLORS, available in 40 ATTRACTIVE shades. Suitable for all types of concrete products. Write for our new color card, copy of "Suggestions For Using Cement Colors", and for free samples and price list.

Manufactured by:

Landers-Segal Color Co.
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LOWER COST
PACKER-HEAD WINGS
Proved to last as long or longer—yet cost considerably less. Write for prices.
TEXAS FOUNDRIES
LUFKIN, TEXAS

One #9 Joltcrete Block Machine complete with 8" Box and one Air Lift and Offbearing Hoist. 5,000 pressed Steel Pallets. All in good condition. Seventy Steel Racks, capacity, 50 blocks each. One extra agitator motor and one extra drive motor. Must be sold together. Price $5,000.00.

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Modern Ready-Mix Concrete Plant

Located in city of 15,000. 6 small towns in 20 mile area. No competition within a 55 mile radius. Major mining company accounts. Large school building program in progress. Volume of business increasing yearly. BOX M-62, CONCRETE PRODUCTS, 309 W. Jaskson Blvd., Chicago 6, Ill.

CONCRETE BRICK COLORS
CEMENT COLORS
MORTAR COLORS
made by
BLUE RIDGE TALC CO., INC.
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HydroKorpak Block Machine. Completely automatic. Excellent condition. 4000 pallets for 4", 8", 12". Can be seen in operation. Installing larger equipment. Make us an offer.

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3 yard Smith Standard truck mixer in excellent operating condition. Will sell very reasonable being forced to go to larger truck mixers.

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L-5 Lith-I-block three block machine, new 1951, complete with molds and attachments for all sizes of blocks and quantities of spare parts; replacing with new equipment; available immediately; priced to sell.

BUILDER'S BLOCK COMPANY
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Telephone Chestnut 5197

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Splash Block - Stepping Stone and Lintel Molds

Concrete Mold & Engineering Co.
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IMMEDIATE DELIVERY

Factory Rebuilt Columbia Model #8 Automatic complete with 8" Standard Mold $7500.00
Also Semi-Automatic Model #8 complete with 8" Standard Mold $5500.00
F.O.B. Mukwonago, Wisconsin

CONTACT
COLUMBIA MACHINE, Vancouver, Washington
or
COLUMBIA MACHINE, Mukwonago, Wisconsin

FOR SALE

2000 Pressed steel manhole block pallets, code "Magic".

Joltcrete No. 9 with offbearer, 8" Mold and Pallets. Excellent condition.

CONCRETE PRODUCTS SUPPLY CO.
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FOR SALE

1—Jaeger Mixer — 16S — Electric — Skid mounted overhead with 10' track & skip.
1—3 yd. DUMPCRETE on F7 Ford.
2—2 yd. DUMPCRETE on F5 Fords.

Excellent condition and priced at $6000.00

CHAMBERSBURG DUNTILE CO.
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Besser Super Vibrapac, Excellent Condition, Available immediately, Priced right.

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SMITHKO
LIMEPROOF CONCENTRATED DRY COLORS
Write for samples and brochure, "Getting Results With Color in Concrete and Cement Products"
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BUILD GOOD WILL
Advertising necessities for the block industry. Line Pins, Twigs, Modular Coursing Stick. Also the new Block Calculator and Wood Corner Block. All imprinted with your advertising. Complete catalog on request.
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99 DEERING ROAD, MATTAPAN, MASS.

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Fork and platform power lift trucks, used and guaranteed factory rebuilts.
ERICKSON POWER LIFT TRUCKS, INC.
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Phone—Sterling 1-9508

FOR SALE: STROUDSBURG MACHINE PIPE FORMS, NEW AND NEVER USED
6—12x2x3' Reg. T&G Jacket.
2—24x3x3' Reg. T&G Jacket.
2—15x2½x3' Reg. T&G Jacket.
1—30x3½x3' Reg. T&G Jacket.
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These forms for sale well below cost.
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PALLETS — FORMS — PACKERS
Custom made pipe forms for packerhead machine or casting, smooth or corrugated, any length. Pallets with replaceable rubber wearing surface; also usable on worn out pallets. Packer shoes for any pipe or tile machine.
MACHINERY & ENGINEERING DIVISION
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persistent
hoarseness
or cough

...is one of the seven commonest danger signals that *may* mean cancer...but should *always* mean a visit to your doctor.

The other six danger signals are —Any sore that does not heal ...A lump or thickening in the breast or elsewhere...Unusual bleeding or discharge...Any change in a wart or mole... Persistent indigestion or difficulty in swallowing...Any change in normal bowel habits.

For other facts about cancer that may some day save your life, phone the American Cancer Society office nearest you, or write to "Cancer"—in care of your local Post Office.

American Cancer Society

FLEMING 180
Completely rebuilt. Has Press-Head Roller feed drawer, 8-inch mold box. Guaranteed. Price $2700.00
Reply BOX M-66, CONCRETE PRODUCTS, 309 W. Jackson Blvd., Chicago 6, Ill.

FOR SALE
L-3 Lith-I-Bar Block Machine, 2 block per cycle, fully automatic, 4"-5"-6"-8" and 12" block attachments. 1900—18 x 18 inch steel pallets. Lots of spare parts, good condition, now running. Reasonable.
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STOP *that* WATER
With FORMULA NO. 640
A clear liquid which penetrates 1" or more into concrete, brick, stucco, etc., seals—holds 1250 lbs. per sq. ft. hydrostatic pressure. Cuts costs: Applies quickly—no mixing—no cleanup—no furring—no membranes. Write for technical data—free sample.
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No. 10 Model standard Columbia replacing with latest model Columbia to make drain tile and roman brick on same machine. Excellent condition, terms.
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FOR SALE
1500 pallets 8" pressed steel ..... @ 35c ea.
1500 pallets 12" pressed steel ..... @ 60c ea.
320 sash pallets 8" pressed steel ..... @ 40c ea.
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In good condition
BEN WAANDERS BLOCK CO.
Phone 144J, Allegan, Mich.

Complete
PAKCRETE BLOCK MACHINE
Single blockmaker-Mixer-Conveyor.
1000 Plates-Racks. — Misc. Acces.
Used very little. Has been in storage
$2000.00
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Small Block Plant Owner
I have quite a supply of used machines that are replaced by larger plants who need larger production. Some of these setups are in very good condition. As they are a surplus to me, I will sell on any reasonable terms with payments as low as $50.00 a month.
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SECURITY
BONDS
NOW!

FOR SALE — MUST SELL!
BESSER SUPER TAMPER—Makes 2—8" at a time. Produces 780—8" or 390—12" per hour. Good condition. Fully Automatic. All sizes of modular dimension.
APPROXIMATELY 1,800 PLAIN STEEL PALLETS (⅛ x 16½ x 18½).
APPROXIMATELY 70 STEEL WELDED RACKS, holding 72—8".
ENTIRE PACKAGE FOR $5,500, OR ANY PORTION AT A REASONABLE PRICE.
BOX M-70, ROCK PRODUCTS
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FOR SALE
DEMONSTRATOR
NEW YELLEN Hi-SPEED PLAIN PALLET BLOCK MACHINE
THE NEWEST LOW COST PLAIN PALLET MACHINE
THOROUGHLY TESTED PROVEN
JOHN J. YELLEN
PERTH AMBOY, N. J.

FOR SALE
EXTRA GOOD USED EQUIPMENT
No. 9 Stearns Joltcrete complete with 8" attachment.
Siding Attachment for a No. 9 using Baba & Baton pallets.
No. 294 Chase steel racks, 72 block cap.
Cast Iron Fillers for Header Block.
ZONAL 3¾" press steel pallets.
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Nelson Model Q bucket loader on cats, loads 2 to 3 yards per minute, good shape. Burk auto hydraulic, 3 block machine. Makes 9 block per min. Childers 3 block hand oper., air controlled block machine with 105 cfm compressor (Chicago). Incl. off bearing hoist & molds complete ready to go. Will demonstrate. Priced right to move.
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WANTED
Cement Silo, 500 to 800 barrel, with under track and loading screws.
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FOR SALE
One 2 block semi-automatic machine —plain pallet. Like new.
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Madison 6-3477

Besser Multi-Mold Block Machine
with 5 cubic foot mixer and 5 horsepower electric motor. All for $750.00.
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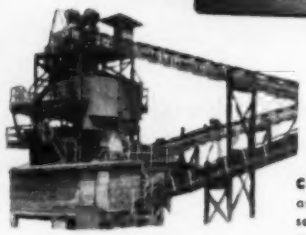
BEAT the HIGH COST of LIFTING

with efficient time-saving...

Hi-Speed job-fitted

BAUGHMAN CONVEYING EQUIPMENT

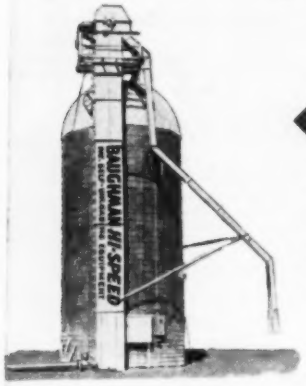


MODEL 225

Conveyor Combinations assembled from standardized sections. Quickly "job-fitted" to any bulk material handling problem. Prompt delivery from stock. Bulletin A-342.

MODEL Q-51

Hi-Speed Screw Conveyor for material that rolls or becomes fluid in motion. Permanent installations or portable models as above. Underbin and undertrack screw loaders easily attached. Write for Bulletin A-295.

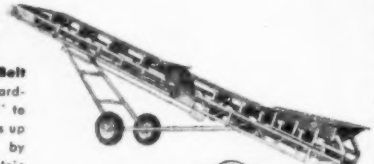


MODEL 175

Belt and Bucket Elevator. Fully enclosed buckets, centrifugal discharge elevator for permanent or temporary installations. Also open belt and bucket models, 210 and 220 available. Write for Bulletin A-299.

MODEL 230

Portable Troughed Belt Conveyor . . . standardized and "job-fitted" to your needs. In lengths up to 46 ft. Powered by gasoline or electric motor. Write for Bulletin A-296.



BAUGHMAN

BAUGHMAN Mfg. Co., Inc.
124 Arch St. Jerseyville, Ill.

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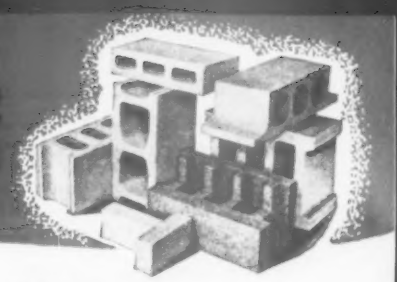
Besser Automatic Vibrapac



Gives You MORE!

The growth of the concrete block industry coincides with the growth of the Besser Manufacturing Company. 50 years ago, Besser made the first concrete block machine. Since then, the company has devoted its constant and untiring efforts to producing better block machines, pioneering new types and improving production methods. Today — the Automatic Vibrapac is the result of that half-century of pioneering and developing. The machine gives you MORE . . . more power, more smoothness, more ruggedness, and, what every block plant operator is primarily interested in, more block production. No doubt about it — the Automatic Vibrapac is the world's leading concrete block machine — a PROFIT MAKER for block plants everywhere.

BESSER MANUFACTURING CO. • Box 135 • Alpena, Mich., U.S.A.

MORE power

The Automatic Vibrapac provides unidirectional vibration from two 10 horsepower, high starting torque vibrating motors — DOUBLE the horsepower of any other block machine.

MORE production

The famous Besser cam and roller principle assures maximum block production. The slow revolving cam, with a roller riding on its surface, delivers power with pin point precision and with steady, uninterrupted regularity.

MORE smoothness

The Vibrapac is equipped with gravity actuated block moving weights which assure much smoother delivery of the finished block at high speeds.

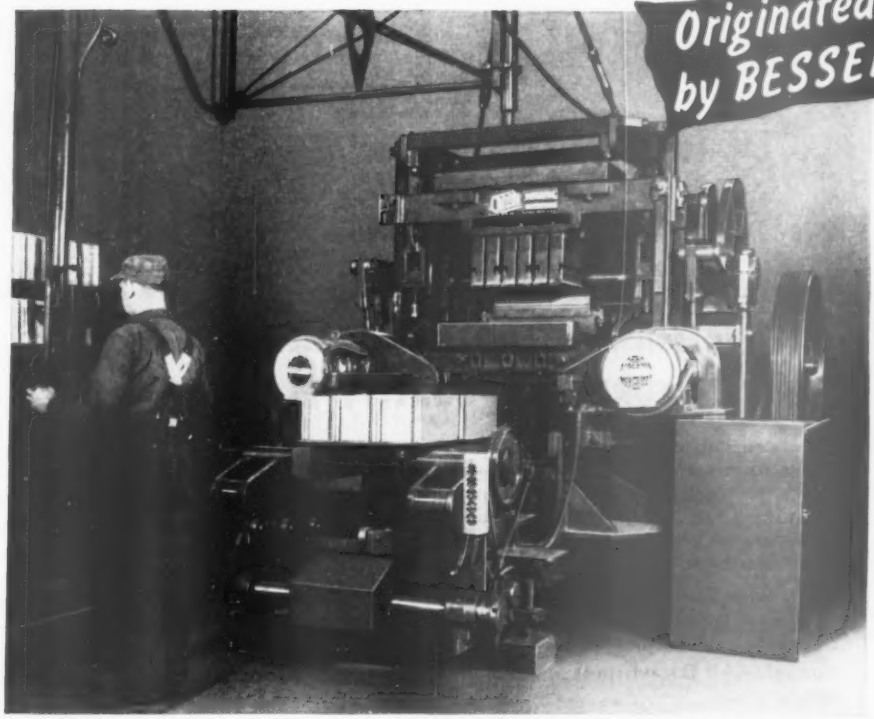
MORE ruggedness

The machine frame of the all-steel electrically welded Vibrapac is made of 1½" thick steel—almost unbelievable, but it's a fact. That's why the Vibrapac is able to produce block, day-in and day-out, without interruption — for YEARS.

Watch VIBRAPACS Work

Step into any Vibrapac block plant and see high quality block made, *automatically*. Notice there are no lost motions and no time is wasted. Pallets and mixed materials are fed automatically. As block are completed, they are quickly transferred to the racks. No manual lifting. Off-bearer merely guides the power hoist.

Vibrapacs are versatile. They make ALL types and sizes of high-quality masonry units on ONE set of Plain Pallets. Vibrapac Block are specified by progressive architects — used by leading contractors—produced and sold by leading concrete products plants.



Your profits depend largely on the uninterrupted production of high quality masonry units. The Automatic Vibrapac enables you to reach this goal. It produces block of exact height and uniform density on a continuous production line. Three 8"x8"x16" modular units (or equivalent in other sizes) are made at a time on one Plain Pallet. No machine operator is required.

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1904-1954

A Half Century of Concrete Masonry Progress!

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STEARNS 50-3 SPELLS PROFIT

SHAFFER BLOCK WORKS

CEMENT BLOCKS. SAND. SHALE. STEEL WINDOWS

PHONE 483

SOMERSET, PA.

August 27, 1954

Stearns Manufacturing Company, Inc.
Adrian, Michigan

Gentlemen:

We too are more than pleased with our new Stearns 50-3 block machine. The results are beyond our highest expectations.

With our new Stearns 50-3 and five less men, we have more than doubled the combined production of our two former machines.

When better block machines are made, Stearns will make them. That goes for the blocks made on this great new machine as well. All the operator has to do is to start the machine; from there on in it's the Stearns 50-3's business.

Having used your block machines exclusively since we started operations in 1945, we know Stearns spells "Profit" in any man's language. For top production of quality units, you just can't beat the Stearns 50-3.

We want to take this opportunity to congratulate your company on this new wonder of the concrete block-making industry and to thank you for the fine service and cooperation we have received from you over the years.

Very truly yours,

William S Shaffer

William S. Shaffer, President
Shaffer Block Works

...in any man's language!

PROFIT in MORE PRODUCTION...

PROFIT in LESS OVERHEAD...

PROFIT in MORE STEADY CUSTOMERS through UNIFORM, TOP QUALITY BLOCKS

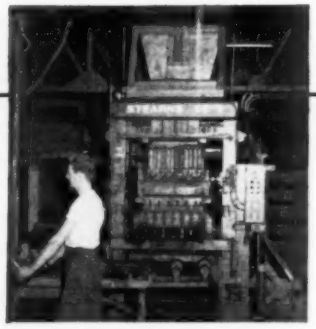
Here's still another record set by the "new wonder of the concrete block making industry"— the Stearns 50-3 Concrete Block Machine. Just read the following quotation taken from the above recent letter to Stearns from William S. Shaffer, president of Shaffer Block Works, Somerset, Penna., a proud new Stearns 50-3 owner:

> "With our new Stearns 50-3 and five less men, we have more than doubled the combined production of our two former machines."

Enough said! But why not read the whole letter for your own future profit!

STEARNS
MANUFACTURING COMPANY · INC
ADRIAN · MICHIGAN

Complete Concrete Products Plant Equipment — Standard of the Industry



"When better block machines are made, Stearns will make them! For top production of quality units, you just can't beat the Stearns 50-3," says Mr. Shaffer of his new machine, above. Completely automatic with a unidirectional, vibratory heart, the one-man, three blocks-per-cycle Stearns 50-3 is delivered as a complete package, with the Stearns Pneumatic, Magnetic Offbearer and Stearns Automatic Pallet Return with pallet cleaning and oiling mechanism. Operator is Earl Hutchison.

Here is the president and owner of Shaffer Block Works, right, surrounded by his Stearns 50-3's uniform, top quality blocks which mean more steady customers. Nevin Dunmeyer, foreman, left.

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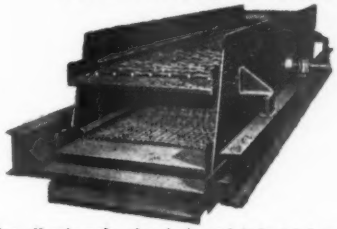

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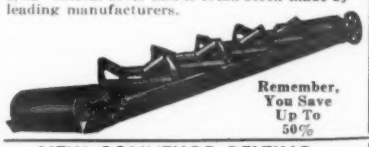

Remember, You Save Up To 50%

Belt Width	Length of Conveyor	List Price	Sale Price
16"	20'	$ 991	$ 548
16"	45'	1785	937
18"	25'	1229	684
18"	45'	1839	1005
18"	85'	3209	1665
18"	100'	3704	1912
24"	25'	1322	773
24"	45'	2062	1145
24"	100'	4097	2166
24"	130'	5207	2773
30"	24'	1421	847
30"	65'	3101	1718
20"	30' (5-Ply	1453	864
20"	50' Belt)	2189	1301

Other lengths and belt widths at bargain prices.

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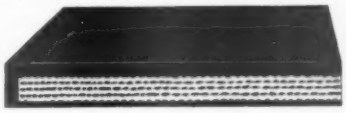

Width	Ply	Top Cov.	Bottom Cov.	Duck Carcass	Price
16"	4	1/8"	1/32"	28 oz.	$2.62/ft.
18"	4	1/8"	1/32"	28 oz.	2.90/ft.
24"	4	1/8"	1/32"	28 oz.	3.76/ft.
30"	4	1/8"	1/32"	28 oz.	4.60/ft.
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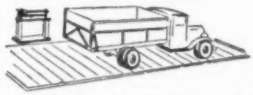
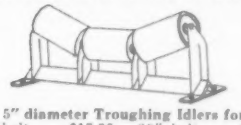


26 Ton Truck Scales (Pit Type) .....$ 782.00
30 Ton Truck Scales (Portable) 1530.00

NEW IDLERS & RETURN ROLLS



3-roll, 5" diameter Troughing Idlers for

16" belt	$17.25	30" belt	$19.50
18" belt	18.00	36" belt	20.25
24" belt	18.75	48" belt	21.75

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16" belt	$ 6.75	30" belt	$ 8.25
18" belt	7.13	36" belt	8.75
24" belt	7.50	48" belt	10.25

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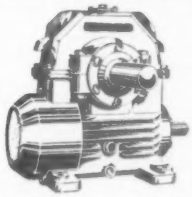

HP	Ratio	Price
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10	20:1	228.00
15	20:1	286.00
2	30:1	81.00
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Quarry Equipment

Symons 4 foot cone. Fine bowl.
Cedarapids Rock-It plant w/2225 jaw, 3033 hammermill.
Telsmith 13B gyratory.
936 Telsmith Wheeling jaw.
10x7 Allis-Chalmers Blake type jaw crusher. Rebuilt.
#1 Cedarapids Kubit impact breaker. New condition.
42" x 10' Cedarapids apron feeder.
15 cu. yd. Cedarapids sand drag. New.
60-ton, 2-comp., 8'x18' storage bin w/clam gates.
Special bins to your specifications.
Conveyors—18"—24"—30"—36". Also belt.
24" dia. x 30" face magnetic pulley.

SHOVELS AND CRANES

Lorain L-820 diesel drag, clam, crane shovel.
Lorain 77, 1½-yd. diesel shovel, good condition.
Lorain 40A on Autocar 10-Wheeler.
Lorain TL-25-J gas shovel or hoe.
Link-Belt LS85 Diesel Combination. Rebuilt.
Unit 514, ½-yd. gasoline crawler shovel, rebuilt.

TRACTORS, GRADERS & EUCLIDS

Caterpillar D7 with blade. Excellent.
Caterpillar D6 with blade. Reconditioned.
Caterpillar D4 with 1¼-yd. Traxcavator.
TD9 International with 1-yard Loadover.
TD9 International with front end shovel attachment.
Model CR Tournapull w/16-yd. Model E16 Tournarocker, rebuilt.
2—27FD Euclid rear dumps.
6—43FDT Euclid bottom dumps.
4—25FDT Euclid bottom dumps.
1—3BV Euclid loader.

AIR COMPRESSORS

600 cu. ft. Gardner-Denver. Rebuilt.
500 cu. ft. Gardner-Denver diesel. Rebuilt.
500 cu. ft. Ingersoll-Rand.
365 cu. ft. Gardner-Denver. New condition.
105 cu. ft. Gardner-Denver. New condition.

L. B. SMITH, INC.
Dept. A
CAMP HILL, PA.
Phone Harrisburg 7-3431

FOR VALUES — BUY BRILL

2—NEW I.R. Air Compressors 3580 CFM, 110 PSI, Type PRE-2, size 30"x 18"x22", 220 RPM with I.R. Class 1210-HM-2, with condensate traps, control, 600 HP. G.E. Synchronous motor, exciter and panel.

KILNS-DRYERS

2—9'x80' Allis-Chalmers, ⅝" shell.
1—8'x125' Vulcan ⅝" shell.
1—8'x70' Allis-Chalmers ¾" shell.
1—7'x120' Vulcan ½" shell.
3—6'x25', 6'x30', 6'x40' steam tube.
1—5'x67' Reeves 5/16" shell.
1—5'x40' Cummer ⅜" shell.
2—5'x30' Cummer 7/16" shell.
1—4'6"x50' Vulcan ⅜" shell.
2—3'10"x16' Link Belt Roto-Louvre.

PULVERIZERS-MILLS

2—Raymond High Side Mills 3 and 5 roll.
2—#40, #10 Raymond IMP Mills.
2—Raymond #1 Pulverizers with 6' whizzers.
5—Hardinge 4½'x16", 5'x22", 6'x22", 6'x48", 10'x48".
3—Patterson 6'x8' Ball Mills.

CRUSHERS

1—Traylor 56"x24" Crushing Rolls.
1—Traylor 42"x48" Jaw Crusher.
10—Jaw Crushers 5"x6" to 42"x48".

SCREEN SEPARATORS

6—Tyler Hummer Screens 3'x5', 4'x5', 4'x7', 4'x10', 5'x10', 4'x15'.
1—Link Belt 3'x8' double deck Screen.
5—Rotex 40"x84", 40"x120".
4—Air Separators 6', 8', 10', 14'.

OTHER ITEMS

2—Chicago 14"x7" Air Compressors, 434 cfm.
2—Oliver Rotary Dewaterers 8'x4'.
12—Bucket Elevators 20' to 75' centers.

COMPLETE LIME HYDRATING PLANT
consisting of two #3 Clyde Hydrators, two #1 Raymond Mills, Elevators, Conveyors, etc. Send for Details.

PARTIAL LIST
Send Us Your Inquiries

BRILL EQUIPMENT COMPANY
2401-3 Third Ave., New York 51, N. Y.
4101 San Jacinto St., Houston 4, Texas
Tel: Cypress 2-5703

SPECIAL CRUSHERS!!

Pioneer 40x22 roll crusher Diesel powered.
Cedar Rapids 40x30 Hammermill Twin GMC Diesel.
Jeffrey Flex-Tooth 42x36" hammermill.
Pennsylvania C-4-30 Reversible Hammermill.
Jeffrey Type B Hammermill 36x42".
Raymond No. 412 bowl pulverizer mill.
Buchanan 36x42" Jaw Crusher.
Superior McCulley No. 18 Gy. Crusher, 36" opening.

SAND AND GRAVEL HYDRAULIC DREDGES

Ellicott 12"x10" new pump with new V-12 385 HP Diesel engine. Port. steel hull.
Ellicott 8" with cutter. Diesel Hull 48'x18'x3'6" 8" Hydraulic, Diesel. On 32'x8' steel pontoons.
Amsco 10" Diesel power portable. Excellent.
6" portable Diesel complete with cutters, etc.
8" H-P twin Diesel drive. Complete.

CONCRETE PLANTS AND EQUIPMENT

Erie Strayer portable complete 30-40 yds. hr.
Erie GA, 36 yds., 3 compts 2 yd. bat., 25' bag hop.
H-K 100 tons 3 compt aggr. two 450 bbl. cement silo.
Noble CA-155 fully automatic 150 tons 5 compts.
Noble CA-154 4 compts. 500 bbls cem. 2 yd.
Johnson 150 yds. new 1950 3 compt. aggr. one cement ground silo 500 bbls. two 28-8 mixers.
Fuller-Kinyon Model H Port. cement conveyor.
NEW F-8 100 ton agg. bin 3 compt.
NEW F-8 400 bbl. cement bin complete.

BULK CEMENT TRAILERS

Gramm 125 bbl. Baughman tandem axle. New 1951.
Gramm 100 bbl. tandem axle air slide. New 1951.

CRUSHING PLANTS

Universal Model 536-P Primary 2036 crusher.
Cedar Rapids "Pitmaster" port. washing-screening.
Cedar Rapids Portable Super Tandem, excellent.
Austin Western port. Model 101. New 1953.
Pioneer WA-300, crushing, washing, screening.
Cedar Rapids AAA Port. Primary crusher 20x36.
Cedar Rapids 40x33 Port. Secondary, Diesel.
Cedar Rapids Portable Master tandem.

CRUSHERS

JAW: Acme 10x20, 14x26, 14x28, 10x42, 16x32, 18x32, 25x40. Eagle 20x36. Diamond 24x36". Cedar Rapids 10x20, 20x36, 25x40. Farrell 10x20, 13x30, 14x36, 18x36, 36x48. Buchanan 36x42. Good Roads Reliance 15x30. Traylor 18x36, 24x36. Allis-Chalmers 30x18. Good Roads 10x30. Telsmith 18x32. Champion 1030, 1040, 1236, 1530.
GYRATORY: Allis-Chalmers-McCully, 6", 7½", 8", 8", 12K, 20", 30", 42", 14", Newhouse, 24", 36". Gyrasphere, 18", 28". Intercone Telsmith, Telsmith 5H, 10-B, 13-B, 16-B. Kennedy Van Saun 7, 19, 25½-S, 37. Traylor Ty 1'8", Ty 2'4", T-4½".
ROLL: Cedar Rapids 40x20. Diamond 40x22. Pioneer 30x18. Telsmith 24x16. Pioneer 30"x18". New Holland 24x16.
HAMMERMILL: Size 4 Williams Jumbo, Pennsylvania SX2, 22x22. Cedar Rapids 20x33. Jeffrey 36x42, Jeffrey 36x24, 36x40.
BALL MILL: Hardinge 10'x48", K.V.S. 6'x8' Type M Air Swept J-H 6'x6', Hardinge Conical 6'x22". Colorado Iron Works 5'x6'; Marcy No. 64½. Hardinge conical 10'x36".
ROD MILL: March 2'x6', 3'x6'. Allis-Chalmers 4'x8'. Hardinge No. R 206. Marcy 8'x12'. Hardinge 8'x22".
CONE: Symons 2' and 3' coarse bowl 4' short head.
TUBE MILL: Smidth 5½x20, K.V.S. 4'x7', Traylor 5'x22'.
DRIERS: Vulcan 4½x50', others 7'x20', 6'x80', 7'x70', 6'x40' and Cedar Rapids 60"x24'.

SHOVELS—CRANES—DRAGLINES

P&H 955 ALC Crane 2½ yds. 130' bm. 1951.
P&H 655-B, 1½ yd. Diesel Crane, 60' bm.
P&H 255-A, ⅝ yd. Shovel-Crane, Diesel.
N-W 80-D 2½ yd. Dragline, Diesel, 100' boom.
N-W Model 6, 1½ yd. Diesel Shovel.
Northwest 80 D Diesel Shovel 2½ yd. New 1951.
Lorain L-820 2-yd. Shovel-Drag-Crane 100' Bm.
Lima 1201, 2½ yd. Diesel Shovel.
Manitowoc 3500, 2½-yd. High Lift Shovel.
Buc-Erie 54-B Diesel Shovel, 2½-yd.
Manitowoc 3500 Dragline 140' boom, new 1950.
Northwest 25 Diesel, ⅝ yd. Shovel.
Lorain Model MC 414 Moto-Crane 80' boom.

SCREENS

Telsmith heavy duty washer 60"x13'.
Simplicity 4'x10' four deck.
Symons 4'x14' double deck.
Tyler 4'x10' two deck heavy duty, motor, Gen. Set.
Telsmith 5'x12' dbl. deck elec. motor.
Cedar Rapids 4'x12' dbl. deck elec. motor.
Pioneer 4'x12' 2½ deck elec. motor.
Pulsator 4'x8' four deck.
Acme 5'x24' Rotary Scalper elec. motor.

TRACTOR - TRAXCAVATORS FR. END LOADERS

2 Cat. D8 Angledozers with DDPCU rebuilt.
Int. TD-18A with B-E Bulldozer.
Int. TD-24 with B-E Cable Bulldozer.
All-Chal. HD19 Angledozer, Hydraulic.
Hough HF, ¾ yd front end loader 1952.
Int. TD-9 with Buc-Erie 1 yd dozer shovel.
Cat. D4 Traxcavator with 1 yd. bucket, hydraulic.

TRUCK MIXERS MOUNTED OR UNMOUNTED

4—4½ yd. Jaeger high discharge.
3—5½ yd. Ransome high discharge.
5—4½ yd. Rex high discharge.

DERRICKS

American 30 ton Guy Derrick 106' boom, 116' mast.
American Terry 20 ton Guy Derrick, 100' boom.
Clyde 30 ton stiff leg 90' boom.
Guy Derrick, 15 tons, 115' mast, 105' boom.
American 25 ton stiff leg derrick, 90' boom.
Special 35 ton stiff leg derrick, 100' boom.
Nat'l Bridge 30 ton Guy Derrick, 100'.
American 30 ton stiff leg, 100' boom.

ASPHALT PLANTS

Barber-Greene Model 845. Complete.
Hetherington-Berner Model M-12 1500# Pugmill.
Madsen 4000# Complete. New 1951. Excellent.
Overmander Monotrole Bit. Mixing Plant, T-34
Hetherington-Berner Moto-Paver.
Barber-Greene Plant 848 Mixer, 836 Dryer Diesel
Cummer 2500# Hot Mix Plant.
Monotrol complete plant. Three years old.

CABLEWAYS

Sauerman slack line 1¼ yd.; electric 90' mast.
Sauerman 1 yd. with 100 hp. electric motor, complete
Sauerman 1 yd. with Wakesha gas hoist.

RICHARD P. WALSH CO.
30 Church St. — New York, N. Y.
Cortland 7-0723 — Cable: RICHWALSH

SELLING FROM CLOSED PLANT

LOCATED IN NEWPORT, DEL.

1—Rotary Kiln, 10'6" D x 112' L
1—Steel Ball Mill, 6' D x 16' L
3—Pebble Mills, 4'6" D x 12' L
4—Dorr Thickeners, 15' Dia.
1—Dorr Thickener, 22' Dia.
6—Dorrco 3" Slurry Pumps
4—Filter Presses, 24" and 30"
4—Muffle Furnaces, each with (2) 24" dia. x 8'6" long rotary Chrome Nickel Alloy Tubes.
15—Wood Tanks—to 28,000 gal.
1—Jeffrey Pivoted Bucket Carrier, 185 lin. ft., 16" x 18" pivoted buckets.
9—Trough Belt Conveyors, from 11' to 99' long
4—Pan Conveyors, from 12' to 95'
2—Bucket Elevators, Steel, 60' and 95' H
2—Spencer Turbo Compressors—1200 CFM and 4000 CFM

PERRY EQUIPMENT CORP.
1418 N. 6th St., Philadelphia 22, Pa.

DEPENDABLE USED MACHINES

Special, Model 503 Koehring 1¼ yd. dragline with Caterpillar Diesel motor and 80' boom.

Michigan TLDT truck crane	Pioneer 17V Diesel port. plant	Butler fork truck
Lorain ⅜ yd. dragline	Pioneer Mesabi 5x12 screen	3000 lb. wrecking ball
Lorain ½ yd. dragline	Pioneer Mesabi 4x16 screen	Eagle cinder crusher
Byers ½ yd. shovel	Lessman loader; power steer	40' bucket elevator
Ransome 4½ yd. mixer	Cedar Rapids 16x16 roll crusher	1.5 KVA light plant

These machines reconditioned in our newly-built daylight plant. Come see them!
10030 Southwest Highway — TRACTOR & EQUIPMENT CO. — Oak Lawn, Ill.

CRAA primary, CR Pitmaster 2 unit Port. Crushing PLANTS.
10' Gayco, 16' Sturtevant Air SEPARATORS.
CRUSHERS: 1020 Allis, 1040 & 1536 Diamond, 1218 Acme, 2036 Pioneer, 2436 Lippman, 2450 Champion, 2540 CR, 3042 Pioneer, 4836 Farrell & 4248 Traylor JAW, 7" Newhouse, 10B, 13B, 16B Telsmith, 322R Allis, 10, 16 & 36" McCully, 12K Gates GYR. 2, 3 & 4' Symons Cone.
MILLS: Williams Comet 4 roll. Hardinge 6x4 & 8x4' Ball. CR3033, Dixie 5040 Hammermills.
DRYERS: 4x24, 5x24, 5x40, 5x67, 6x50 & 8x125'.
CHAIN & BUCKET ELEVATOR 122' centers.
40—24" ga. 1½ yd. Koppel Steel Dump CARS.
SHOVELS: Bucyrus 10B, 20B, 38B, 51B, 170B. Lorain 75B, 820. Link Belt K370. Lima 604, 1201. Northwest 25, 6, 78. P&H 855 & 1055. Manitowoc 3000. Marion 92, 93M, 300.
MISC: Stokes DD82 Rotary Tablet Machine Plant for packaging Dry Materials.

Repres: Bonded Scale and Machine Co.

MID-CONTINENT EQUIPMENT CO., INC.
8321 Gannon, St. Louis 24, Mo. WYdown 1-2826

FOR SALE OR RENT

25 ton Orton Diesel Locomotive Crane.
65 ton Porter Diesel-Elec. Locomotives.
44 ton GE Diesel-Elec. Loco., new 1942.
30 yd. Western & Koppel Air Dump Cars.
130 HP Amer. 2D Diesel Hoist & Swinger.
4 yd. P&H Elec. #1400 Quarry Shovel.
2 yd. Bucyrus Erie 51-B Diesel Shovel.
1¼ yd. Manitowoc 2000B Diesel Crane.
1200 CFM Ing. Rand XRE, 200 HP Compr.
50 Steel Dump Cars 36" Ga., 12 ton.

Mississippi Valley Equipment Co.
513 Locust St. St. Louis 1, Mo.

COMBUSTION ENGINEER

Well known national manufacturer with multi-plant operations has opening for a graduate engineer with SPECIALIZED EXPERIENCE IN COMBUSTION ENGINEERING. Will be on the staff of the Vice President of Manufacturing. Proven experience of efficient operation in industrial and process combustion, including boilers, rotary kilns, and direct heat air drying kilns necessary. Must be familiar with gas, coal, oil, and instrumentation. Chicago headquarters. Position will require some travel to company plants, instructing in combustion efficiency. In replying, please state age, education, experience, and salary requirement.

BOX M-69, ROCK PRODUCTS
309 W. Jackson Blvd., Chicago 6, Ill.

FOR SALE
Ready-Mix Concrete Plant

Located in Central Indiana city of 17,000
Prosperous farming-Industrial community
10 small towns within 15 mile radius
No competition within 25 miles
Extensive municipal improvements in progress
10 truck fleet—bins—crane—all necessary equipment.

Reason for selling—Other interests

BOX M-74, ROCK PRODUCTS
309 W. Jackson Blvd., Chicago 6, Ill.

NORTHWEST 80-D
2½ cu. yd. Shovel

with Murphy Diesel Engine
1947 machine in good working condition.
"As is, where is", location Bronx.

$13,000.00

H. O. PENN MACHINERY CO., INC.
140th St. & East River New York 54, N.Y.
Tel. CYpress 2-4800

WANTED

Manager-Operator for Phosphate Grinding Plant to have charge of grinding mills, conveyor system, and loading of ground rock. Permanent position. In replying, give past experience, other qualifications, and age. Address reply to

E. J. CHRISTMAN, Port Director
P.O. Box 1362, Lake Charles, Louisiana

FOR SALE

Limestone Quarry in Central Illinois with #6 coal vein under stone also deposit of fire clay under coal. This operation can be purchased right for cash. For further information or appointment write

P. O. Box 326,
Centralia, Illinois

EQUIPT. IN N.Y.-OHIO-TEX.-NEV.
9 ROTARY KILNS
6x7x80', 10x120', 8x125', 6x80', and 4x42'
7 ROTARY DRYERS
11x75', 5x50', 6x40', 5x35', and 3x30'
B2 AND B3 JEFFREY HAMMERMILLS
3—36x24 Jeffrey with Elec. Motors
DIESEL LOCOMOTIVES
3—65-ton and 44-ton G.E. Diesel Elecs.
10-ton Plymouth, 30-ton Whicomb
104' BOOM STIFFLEG DERRICK
25-ton Dobbie and 3-drum Hoist
HEAVY-DUTY APRON FEEDER
Rex 54"x10'3" Slot Type, Like New
45-TON ELEC. WHIRLEY CRANE
45-ton Washington Gantry, 100 ft. Boom
42 IN. NEW CONVEYOR IDLERS
1500 Conveyor Co. 6 in. Trough and Return

60 East 42 Street **DARIEN** New York, N. Y.

PRODUCER WANTED

Would like to contact party that is financially capable to set up a stationary plant and equipment to quarry and crush a high grade quartzite from an unlimited deposit located in Wisconsin. Have market for large tonnage and will buy output. Will enter into long term contract with the right party. All year round operation. Shipments mostly via rail.

BOX M-68, ROCK PRODUCTS
309 W. Jackson Blvd., Chicago 6, Ill.

FOR SALE
Jaw Crusher—Pebble Mill Hammers

Good Roads Model 20-F Champion Jaw Crusher, 24"x50"

Hardinge 8'x48" Pebble Mill, with Silex lining blocks & pebbles, drive, Syntron feeder, spare trunnion bearing.

34 Kensington #11100 Quad-Edge hammers (new) and 15 #40-14049 shanks (slightly used) for Allis-Chalmers #424 Pulverator.

ILLINOIS SLAG & BALLAST CO.
2817 East 99th St. Chicago 17, Ill.

FOR SALE OR RENT

2—35 Ton G.E. Diesel Elec. Loco., 36" Ga.
1—25 Ton G.E. Diesel Elec. Loco., Std. Ga.
1—30 Ton Plymouth ML-6 Std. Ga. Gas. Loco.
1—100 Ton Alco Diesel Elec. Locomotive.
1—30 Ton Orton Diesel Locomotive Crane.
2—30 Ton Browning Loco. Cranes, Diesel & Steam.
2—1750 CFM Ing.-Rand Syn. Motor Compressors, 1952, unused.
1—50 Ton Pneu. Tire Trailer Tractor Hitch.
1—Large Lot New Spare Parts for 25 Ton Industrial Brownhoist Locomotive Crane.

B. M. WEISS COMPANY
Girard Trust Building Philadelphia 2, Pa.

POSITION WANTED

GEOLOGIST, Ph.D. of recognized standing in research and development; engineering geology and soil engineering applied to roads, foundations, groundwater, hydrology, soil temperatures and frost action; thoroughly familiar with modern geological exploration methods including photogeology; extensive investigations of American and European gravel, sand, and clay deposits; exploration, classification, and quality grading of rocks and aggregates for construction and concrete; many new ideas for improvements and development in afore-mentioned fields of experience; seeks position as problem shooter and consultant.

BOX M-73, ROCK PRODUCTS
309 W. Jackson Blvd., Chicago 6, Ill.

FOR SALE

37½" Kennedy Crusher with 50 HP Synchronous motor 550V. New in 1948. Now in operation. Available anytime. Machine in excellent condition.

Stoughton Crushed Stone Co.
1101 Turnpike Street Stoughton, Mass.
Fieldbrook 4-2211

FOR SALE—USED SHOVELS

120—B BUCYRUS ERIE SHOVEL, 35' boom, 20'8" dipper stick, ESCO 6 yd. heavy duty bucket. Extra ESCO 5 yd. bucket. Excellent condition. Located Oregon.
54—B 2½ yd. BUCYRUS ERIE COMBINATION SHOVEL & CRANE. With 80' boom, shovel front, fairlead, drum lagging, rigging and blocks. Located in Montana. Write, wire or telephone.

WASHINGTON MACHINERY CO., 7329 East Marginal Way, Seattle 8, Wash. Tel. Ranier 1123

J. C. WITT CONSULTING ENGINEER CHICAGO
(5834 STONY ISLAND AVENUE)
and ROCKYRILL, LOCKPORT, ILLINOIS
CONSULTATION, RESEARCH, INVESTIGATIONS
ON THE MANUFACTURE AND USE OF CEMENT
DEVELOPMENT OF EQUIPMENT AND PROCESSES

Plymouth 35-ton gas locomotive, std. gauge Locomotives, 7 to 100 tons, 36" & 56½" ga.
B-Monighan Walking draglines, 9, 7, 5 & 3W.
Page 10-yd. diesel Walking dragline, 152' bm.
Telsmith 36" primary gyratory crusher, steel.
Shovels, draglines, cranes, 1½ to 12 yds.
Euclids, Koehring Dumptors, 17-yd. pans.
Whirley portal gantry cranes, Derricks.
Rotary dryers, kilns: 8x125, 7x125, 60"x67'.
Concrete batching, mixing plants (4)
Bucyrus 2¼ yd. shovel att. only, 55B-52B
H. Y. SMITH CO., 828 N. 8'way, Milwaukee 2, Wis.

POSITION WANTED

QUARRY AND PLANT SUPERINTENDENT—25 Years Experience—Limestone—Kaolin—Sand & Gravel—Feldspar—Phosphate Rock—Bauxite—Supervised All Phases of Rock Products Production—Operation and Maintenance. Available for an interview at your convenience.

BOX M-72, ROCK PRODUCTS
309 W. Jackson Blvd., Chicago 6, Ill.

KEEP ABREAST WITH
INDUSTRY TRENDS
THROUGH
ROCK PRODUCTS

ALSO SEE READY-MIXED CONCRETE AND CONCRETE PRODUCTS EQUIPMENT
WHERE TO BUY ADVERTISING IN CONCRETE PRODUCTS SECTION

• FOR SALE •

OFFERED FOR LESS THAN HALF PRICE

Two 1952 Model Caterpillar DW20 Tractors with W20 Wagons. These are one-owner machines, just traded in on new Caterpillar DW21 Tractors and Scrapers. The Serial Numbers on Tractors: 6W130 and 6W131, and on the Wagons 5S5131 and 5S5120. Both Engines recently overhauled, including all current changes. This equipment is in excellent condition, and one machine has better than average rubber, the other fair rubber. Subject to prior sale.

HOBSON EQUIPMENT CO.

Caterpillar Distributor

(R)

2131 Washington St. Kansas City, Mo.

Phone: HArrison 6488

1—9"x15" Champion Jaw Crusher.

2—10"x20" Champion Jaw Crushers.

1—12"x26" Champion Jaw Crusher.

2—Telsmith Portable Plants—10"x21" overhead eccentric Jaw Crusher, driven by 4 Cylinder Gasoline Engine, 20' Folding Elevator. Steel frame, wheels and draw bar.

1—Austin-Western Portable Plant—10"x16" overhead eccentric Jaw Crusher, driven by 6 cylinder I.H. Gasoline Engine. Steel frame, wheels and draw bar.

1—Allis-Chalmers 10"x24" Roller Bearing Jaw Crusher; practically new.

1—Pair New Holland 16"x16" Rolls (Lot spare shells and parts).

1—12" Enclosed Cent. Disc. Elevator, 78' centers with Motor. Heavy case.

1—3'x5' Link-Belt U.P. Screen—New.

500—New Crosby Cable Clamps.

JOHNSON & HOEHLER, INC.

P.O. Box 102 Lansdowne, Pa.

WANTED

CRUSHER SALES ENGINEER

Well-known, midwest manufacturer of complete line of crushers and other machinery for Quarries, Gravel Plants and Contractor Aggregate Producers has excellent opportunity for experienced sales engineer to work with several good distributors and their salesmen in Southeastern States. Headquarters would be in or near Atlanta, Georgia, and territory consists of the states south of and including Tennessee and North Carolina and east of the Mississippi River. This is a permanent, well-paying position with the opportunity to become Southeast District Manager and to increase earnings after showing ability to produce results. Give complete outline of education and experience and submit recent snapshot or photograph. All replies held absolutely confidential.

BOX M-71, ROCK PRODUCTS
309 W. Jackson Blvd., Chicago 6, Ill.

RAILS

NEW — RELAYING — TRACK ACCESSORIES

MIDWEST STEEL CORP.

514 DRYDEN STREET

CHARLESTON, W. VA.

IMMEDIATE DELIVERY

FOR SALE

BY OWNER

One Ruggles-Cole Type, Parallel Flow, Class MM-14 Dryer, complete with shell, 90" in diameter x 60' long, with tires, main driving gear and pinion, gear guard, internal flight construction, feed head with feed spout and inspection door and connection to combustion flue, discharge head with discharge spout and inspection door and vapor outlet flue, exhaust fan with V-Belt drive, circular type combustion chamber and combustion flue, thrust and bearing base with mechanism.

Dryer also equipped with one size No. 08-300 York semi-automatic oil burner with 3 HP, 440 volt, 3-phase, 60 cycle motor. One Herringbone gear speed reducer including high speed flexible coupling and outboard bearing for reducer with common bedplate for mounting reducer. One Leeds-Northrup "Electromax" Controller with high-low control of burner.

The above equipment is new, having never been used.

For prices and other detailed information, please contact

MONSANTO CHEMICAL COMPANY

710 NORTH TWELFTH BOULEVARD,
ST. LOUIS 1, MISSOURI
Attention: H. W. Persons

Symons 2 deck 3'x10' vibrating screen.
Selectro single deck 4'x6' vibrating screen.
Smithway single deck 40"x7'6" shaker screen.
Hummer type 31 enclosed vibrating screen.
Hummer type 37 single deck vibrating screen.
New Universal Vibrating screens.
Niagara double deck 2'x4' vibrating screen.
Dryer 5'x45', ⅝" plate.
100 gear reducers and gearmotors.
Belt conveyors, 14" to 42".
Belt conveyor parts 14" to 42".
Conveyor belt 12" to 42".
Apron conveyor 18"x11 ft.
Apron conveyor 18"x6 ft.
Apron conveyor 24"x46 ft.
40" slat conveyor 17', new.
Double roll coal crushers w/ knobs.
Cinder crusher 12"x16".
American 24" Standard American Disintegrator.
Wallace Radial Saw, 110 volts.
Darra-James 12" table saw, 110 volts.
Enclosed bucket elevators in steel casing.
Enclosed 12" bucket elevator.
Portable belt conveyor, 14" x 20'.
9"x8' Screw conveyor feeder.

G. A. UNVERZAGT & SONS

136 Coit Street Irvington, New Jersey

QUALITY EQUIPMENT

BOILERS

9—304 HP Kewanee Firebox Boilers, Model 590, 125 PSI, with oil burners & soot blowers, ASME.
4—150 HP HRT Boilers, 150 PSI, gas fired, ASME.
1—50 HP. Titusville, 150 PSI.

COMPRESSORS

1—New, I.R. PRE-2, 3580 CFM, 110 PSI, 600 HP, complete.
1—327 CFM, I.R. Imperial, 100 PSI, 60 HP, 440V., slipring.
1—15,000 CFM, I.R. MTA-465, 4-stage, 20 PSI, 1450 HP steam turbine.

CRUSHERS

18"x36" Jaw, Traylor, Bulldog.
14"x16", Bartlett & Snow, 2 roll.
48" Symons, vert. disc.
42"x14" Traylor, 2 roll.
28"x24" Williams Impact Crusher.
18"x18" Jeffrey, single roll.
12" Raymond, 3 roll, high side.
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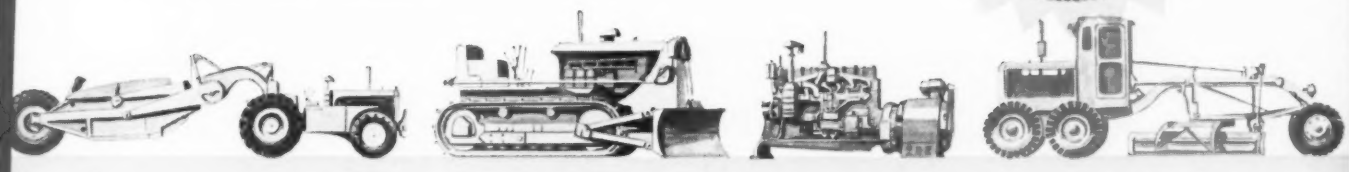

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(2) "CERTIFIED BUY." "Certified Buy" covers units of any make in good condition. Your performance guarantee is in writing backed by your Caterpillar Dealer.

(3) "BUY AND TRY." Bargains in used machines of any make. Buy and try them for a period mutually agreed upon by you and your dealer. Each "Buy and Try" unit carries his written "money-back" agreement.

"BONDED BUY" assurance effective in the United States and Canada

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CATERPILLAR TRACTOR CO., Peoria, Illinois, U. S. A.

GENTLEMEN: Send me, without obligation, more information on "Bonded Buy."

*Name*_____

*Street Address*_____

*City*_____ *Zone No.*_____ *State*_____

IT PIERCES ROCK AT 25 ft./hr.

and only EMERALD CORD Hose stands the pace

GOODYEAR INDUSTRIAL PRODUCTS
G.T.M.-Specified
EMERALD CORD HOSE
A Nonporous, nonflaking, oil-resistant synthetic tube
B Horizontal-braided, "Adhezo"-impregnated, high-strength cord for thinner walls, greater adhesion, extreme flexibility
C Super-tough, nongouging, green cover

SUSPENSION BLOWPIPE JET PIERCING MACHINE burns its way through granites, taconites, quartzites, dolomites and similar rock at 20 to 30 feet per hour. Note hose following the burner right down the hole. Photos courtesy Linde Air Products Company.

Emerald Cord—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

THIS machine literally burns blast holes into solid rock at 15 to 20 times normal drilling speed. Its white hot flame—well over 3000° F.—creates great thermal stresses that crumble the rock into fine particles. Water, also used to cool the burner, is ejected into the hole, turns to steam and blows these particles to the surface.

Big problem for designers was getting the kerosene, oxygen and water down to the blowpipe. Hose was the only answer. But every one they tried failed in a day, or less, from the rugged combination of steam, fuel, oxygen and severe abrasion by sometimes red-hot rock particles.

Their troubles ended, however, when the G.T.M.—Goodyear Technical Man—recommended EMERALD CORD Hose. This super-tough, horizontal-braided, "Adhezo"-bonded hose takes the rough treatment in stride—lasts for months—is now part of the specifications. For similar help on hose, see your Goodyear Distributor and the G.T.M., or write Goodyear, Industrial Products Division, Akron 16, Ohio.

YOUR GOODYEAR DISTRIBUTOR *can quickly supply you with Hose, Flat Belts, V-Belts, Packing or Rolls. Look for him in the Yellow Pages of your Telephone Directory under "Rubber Products" or "Rubber Goods."*

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